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amateur radio



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	Useful Circuits Using Computer Board Transistors ,
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COVER STORY

Lebanese DX Contest

Our cover picture this month shows the "Triple-3" Three-Band Beam for 28, 21 and 14 Mc., produced by J-Beam Engineering Ltd., and available from Sideband Electronics Engineering, Springwood, N.S.W. "tintillate" An Electroplating Process for BRIGHT TIN!
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06		8	5/8"	2-08
07		16	5/8"	2-16
10	1	8	3/4"	3-08
11	1	16	3/4"	3-16
14	1	8	1"	4-08
15		16	1"	4-16
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book, "The Care and Feeding of Power

It so happens that right now on my desk is a pile of these new books. They're really pretty interesting. You see, one of the fellows on our Eimac staff - Bob Sutherland W6UOV - took it upon himself to incorporate the answers to over 400 questions asked of us over the years. In fact, he has spent just about every spare moment away from his shack, preparing this new book. I couldn't believe that it has almost 200 pages. Bob said he just got carried away. He has expanded the original book, which we published back by Laurie Wade, VK2AQW

in '46, so that in its new form it covers all types of power grid tubes in RF and AF service. Even has graphs and things like that.

Now you're probably wondering, where can I get it? Thought you'd never ask. Right this minute there is another pile of these books at our Crows Nest office. Figuring all the time we've spent in getting them ready for you, they're really a bargain at \$3.95 each. If it's inconvenient to call at our office, write me, and I'll be happy to post your copy.

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Laurie Wade Senior Marketing Engineer.



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"PROJECT AUSTRALIS" NOW "W.I.A. PROJECT AUSTRALIS"

It all started in 1965 when the Melbourne University Astronautical Society, one of the many student clubs in the University, decided to design and construct an initial "test bed" satellite package. Thus Project Australis was born.

Project Oscar, the American organisation, agreed to negotiate for space on a rocket for an Australian Amateur built satellite as it had done for the American satellite, Oscars I.-IV.

At the Federal Convention in Brisbane at Easter 1968, the University Club sought the support of the W.I.A. This was enthusiastically given, as was \$400. The initial difficulties, technical and financial, were overcome and the completed satellite was delivered to Project Oscar officials in California in June 1967. Then the big wait began.

The official projects with which Oscar hoped to "hitch a ride" were themselves postpored and delayed. The chances of Australia becoming an operational reality studily faded. Then, early this year, a new organisation was formed in the United States, based on the east coast this time, named the Radio Amateur Satellite Corporation or AMS.A.T. The office-bearers of A.M.S.A.T., beaded by President, Dr. Perry Klein, KSJTE, are professionally associated with the Space Communications industry in the U.S.A.

In brief, the aims of the organisation as expressed in its articles of incorporation are: the provision of salellite for Amsteur Radio communication little for Amsteur Radio communication to the properties of the properties of the convelopment of skills and knowledge of Amsteur communications and space acience, foatering of infernational cooperation and goodwill by joint participation, facilitation of emergency communication by Amsteur salellites, encouragement of extended use of allocations.

A.M.S.A.T. has been able to offer fresh hope that the Australis Oscar A will now be launched and become Australis-Oscar 5. Thus with the support and approval of Project Oscar, the package has been shipped from California to the Washington D.C. area where it is currently undergoing a round of tests by vibration under vacuum at high and low temperatures and tests to ensure that no out-of-band spurious radiations exist that might interfere with official experiments.

A.M.S.A.T. is negotiating with the National Aeronautics and Space Administration (N.A.S.A.) for a "piggy back" launch in the near future. Apart from saying that it is hoped that a launch will occur before the end of this year. it is not at this time to be more precise. One interesting technical point is that the launches likely to be available to A.M.S.A.T. are of a higher altitude than originally planned by Oscar and therefore signals will be weaker by about 6 db. However, the Project Australia group advise that the satellite should be clearly readable by reasonably wellequipped stations. However, they suggest that a low noise converter or preamplifier would be a good investment for stations interested in receiving the satellite. So much for the history and the technical side.

Whilst all this has been going on, earlier this year the Project Australis group approached the Federal Executive of the Wireless Institute of Australia. Whilst originally the group was University based, it has now, with the passage of time, become Amateur based and for all practical purposes, the Project Australis group has become a group in its own right, no longer directly associated with the University clubs from which it originally came.

As a result of these discussions, and after reference to the Federal Council, Project Australis is to become a Federal activity of the WJ.A. to be known as "WJ.A. Project Australis". The Co-ordinator will be appointed by the Federal Council. In other words, in the past, Project Australis has been a group quite independent from the Institute,

though encouraged and supported by the Institute. Now it becomes part of the Institute organisation and its policy becomes the ultimate responsibility of the Federal Council. I think this is a very significant and exciting move.

It seems to me to be eminently appropriate for our National Radio Society to directly foster such an important activity as Project Australis.

In the August issue of "Amsteur Radio", the spends for the forthcoming Space Frequency Conference was published. The pressures on v.h.f. and u.h.f. bands caused by the requirements of space communications is rapidly increasing. That the Amsteur Service is fully and properly utilising the frequency allocations made to it is one of the more convincing arguments in the Amsteurs' claim for the retention of these bands. But what of the future?

A.M.S.A.T. is encouraging the Australian group to go ahead and produce a "follow on" satellite. This, it is proposed, would be a sophisticated communications satellite. This has already been partially planned on the basis that such a satellite will be designed to take a 144 Mc. signal in and re-transmit that signal at 432 Mc. This project is an exciting one. To succeed, it will be necessary for a satellite to be designed and fabricated with a minimum delay. Let us not under-estimate the magnitude of such a project. It is a big project and will require money far beyond any amount that our organisation can itself afford

I believe that the Institute can play an important part in ensuring the success of this important activity, particularly by providing a firm base upon which the project may continue to grow, and by the provision of an administrative facility that is now much needed, itself benefit much from this closer association with a very worthwhile object.

MICHAEL J. OWEN, VKSKI, Federal President, W.I.A.

PROJECT-SOLID STATE TRANSCEIVER

PART TEN

H. L. HEPBURN,* VK3AFQ, and K. C. NISBET,† VK3AKK

The Power Supply to be described, although designed to suit the needs of Project Transceiver, will also run any equipment requiring 12/14 volts d.c. at up to 5 amps. Many of the low- and high-band f.m. and a.m. "Carphones" fall into this category. It can also be used as a very useful general purpose low power supply.

With respect to the power supply's use in the transcriver, the supply needs to have some specific characteristics. It is preferrably needs to have some specific characteristics, It is preferrably needs to be supply the supply of the vide current range encountered—put voltage should remain reasonably constant, that is, it must have good brought of the put voltage should remain reasonably constant, that is, it must have good brought of the put voltage should remain to overload. For example, if the p.a. final translator lies for any reason to draw translator lies for any reason to draw about a "refuse" to deliver such current or at least, limit the current drawn or at least, limit the current drawn

The design now described complies with all these requirements. With the output open circuit, the voltage is 15. With a 3 amp. load (roughly the peak value drawn by the transmitter) the output has dropped by only half a volt. The circuit is so designed that the transmitten of the control of

While the supply will not withstand a short circuited output for long periods of time, it is capable of limiting the output current to a safe value for long enough to allow the fuse in the centre tap of the transformer to blow.

centre tap of the transformer to blow.

Fig. 27 gives the circuit diagram for the complete unit.

A 36 volt centre tapped transformer upplies a full-wave bridge using two BYX88/300 silicon diodes. These diodes are rated at 300 volts p.l.v. and 6 amps. average current drain. Any other diodes assence current capability can be used. Two 2,000 uF. 35 volt working capacitors form the primary smoothing. All the output of the two capacitors the to the regulator/limiter section, input to the regulator/limiter section.

The base of the first regulator transistor, an R.C.A. 283053, is held at a constant 18 volts by means of a seers MPFIOZ as a constant current dropping resistor is the same as that used on the contract current dropping resistor is the same as that used on the sub-regulator/distribution bosard de-emitter of the 283053 is directly coupled to the base of the main 2733055 regulator transistor. Further likering is called a contract the couplet which are sub-regulator transistor. Further likering is called a contract the couplet which can be contracted as the couplet which are sub-regulator as the couplet which is contracted as the couplet which is the couplet which is contracted as the couplet which is the contracted as the couplet which is the couplet which is

4 Elizabeth Street, East Brighton, Vic., 3187.
 25 Thames Avenue, Springvale, Vic., 3171.

To outline (somewhat sketchily) the limiting action of the supply, assume its output to be short circuited. Such a short circuit could be looked upon as a load trying to draw an infinite current.

At the start of the "short" the 2N3055 will attempt to draw an infinite current, but will be prevented from so doing by the 1 ohm resistor in its collector lead and by the inability of the transformer to supply an infinite current. The drop across the 1 ohm resistor and the concurrent tendency of the supply rail voltage to fall, limits the current that the 2N3055 will bass.

However, the base of the 2NNSSS will, unless prevented, try and draw a destructive current, since its emitter is earthed by the applied short. Since the bias supply to the 2NNSSS base is, in effect, through the 22 chm resistor in the 2NNSSS sollector, the drop across since the control of th

POSTSCRIPT

This is the last of the articles describing the main modules of the transceiver. It is proposed in about two months time, to have a final article which describes alternative uses and/or additions that have come to mind during the past eight or nine months. For the order of the control of the control of the of articles has been of interest to readers and that it may have enabled some of them to adopt the ideas contained in the various modules to their own required ends.

AVAILABILITY

The power supply kit, complete with all parts, circuit board and full instructions will be available from early September. It will cost \$28.80 plus 20c postage and can be obtained by writing to 4 Elizabeth Street, East Brighton,

Vic., 3187.

Now that all the modules have been obscribed say, offering an obtainable operation of the same of the

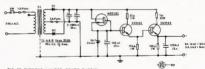


FIG. 27. CURRENT LIMITED POWER SUPPLY.

The emitter realizor of the 2N3053 shows 150 ohms. This should be increased to 1000 to 1500 ohms.



Amateur Radio, September, 1969

"Said the Spider in the Sky"

HOWARD W. KELLEY, K4DSN

"ideals are like stars, you will not succeed in touching them with your hands, but like the seafaring man on the desert of waters, you choose them as your guides, and, following them, you reach your destiny."—Carl Schurz.

A SPINDLY, ugly, clumsy-looking, insect-like contraption that only the world could love has made its debut. In an age of super-smooth and sleek flying machines, U.S. astronauts will soon be flying an aerodynamic misfit to the moon and back.

The final payoff of the Apollo moon mission is to be carried out aboard the spidery Lunar Module (LM) whose homeliness is offset by its beauty of sophistication and practicality. Though its ability to space-by is something of amazement about which pages could be written, this discussion is limited to the LM's communication ability.

IN-FLIGHT COMMUNICATIONS

The communications subsystem aboard the Lunar Module is capable of three two-way combinations of in-flight or lunar surface radio links: LM to the orbiting Command Module (CM), LM direct to earth, and LM to the stronauts who are roaming about the moon's terrain.

As in the Apollo, the LM places its communications responsibilities in Unified S-band and v.h.f. equipment.

In flight, when the LM is on the earth side of the moon and separated from the Command Module, communication with earth is handled on Shand, but between the LM and CM information is passed back and forth on khf.

As in the Apollo S-band system a multitude of information sources on the LM can be transmitted and received at the same time, on the same antenna and often on the same frequency. LM-to-make the same time, on the same frequency. LM-to-make the same time, and the same frequency. LM-to-make the same frequency is the same frequency in the same frequency in the same frequency is the same frequency in the same frequency in the same frequency is the same frequency in the same frequency in the same frequency is the same frequency in the same frequency in the same frequency in the same frequency is the same frequency in the same frequency

S-band voice is the primary means of communication between Mission Control and the two men aboard "Spider" (the voice identifier for the Lunar Module). Backup voice from earth is possible using the digital uplink chambel, but this is usually tied up keeping the LM's guidance computer up-to-date. In response to ranging code signals

sent to the LM, the S-band equipment supplies earth stations with a return ranging code signal that enables Mission Control to track and determine range of "Spider".

Biomedical data pertinent to astronaut heartheat is transmitted by the LM (so earth-bound doctors can monitor and record the physical condition of the spacemen), as is telemetry, voice (using redundant S-band equipment) and, in case voice capability is lost, an emer-

1	S-band Transmit	A		2282.5	
-1	S-band Receive			2101.8	Mc.
1	V.h.f. Channel A		-	296.8	Mc.
1	V.h.f. Channel B		-	259.7	Mc.
		_	-		-

Table 1,-LM Frequencies.

gency key is provided for c.w. communication to the Manned Space Flight Network.

Most of the same information can be exchanged between "Spidee" and "Gumdrop" (voice identifier for the Command Mostly of the Mostly of the Command Mostly of the Command County of the Command County of the Command County of the Command County of the Count

When the two orbiting spacecraft are behind the moon, contact with Mission Control is not possible. Simplex voice is maintained over the 2848 Mc. Grop" at this time while telemetry data is fed over channel B into lape recorders aboard the command ship to be stored and re-trainentified to earth at some control of the conditions between earth and space improve.

LUNAR SURFACE COMMUNICATIONS

When the 18-ton Grumman Aircraft Spider has planted its legs into the moon's crust, the orbiting CM will use which the spider has planted in the spider with the astronauts who are on the lunar surface. The Lunar Module then becomes the world's most expensive fundamental and the spider with the spider

Should v.h.f. between the moonbound astronauts and the command ship not be satisfactory, earth stations may act as repeaters by re-transmitting S-band from the moon back into space to the

TELEVISION

LM-to-earth capabilities from the moon are the same as in-dight except that, in addition, TV may be directly transmitted to earth from the lunar surface. In fact, one of the first assignments of the LM crew, after checking for landing damage, is to erect a 10-foot 2200 Me. parabolic antenna. The television system has a much more utilization use than just to show earthings the spectacle of man's first step on a foreign planet. It will protect the protection of the

The small-hand-held TV camera designed for the Apollo programme weighs only 4_{2} pounds. It has a bandwidth of I cycles to 500 Kc. and scans 10 frames per second (f_{2}) , at 320 lines and 5/8 (f_{2}) , 1280 lines. The 1-inch vidicon consumes about 7_{2}^{1} watts of power.

PLSS-PRONOUNCED PLISS

The well-dressed astronaut who strolls along Lunar Lane wers upon his back an all important unit known that he was a limportant unit known the stroll and the strong and th

The PLSS has a contoured fibreglass shell to fit the astronaut's back, and a thermal micrometeoroid protective cover. It has three control valves, and, on a separate remote control unit, two control switches, a volume control, and a five-position switch for the dual v.h.f. transceiver. The remote control unit rests on the chest.

The astronaut has available to him primary and secondary duplex voice communication, and physiological and convironmental telemetry all of which convironmental telemetry all of which whit, then from the CM to earth or S-band. The v.h.f. antenna for the PLSS is permanently mounted on the oxygen purge system. Two side-tone generation over-ride incoming audio surress or low fuel reserve.

	,			
	secondary	CM	PM	Voice, tracking/ranging, data
2282,500	transmit	LM	PM/FM	Voice, TV, tracking/ranging, date
2272,500		CM:	PM	TV, data
2106 400	primary	CM	PM	Voice, tracking/ranging, data
2101.800	receive	LM	PM	Voice, tracking/ranging, data
296.800	Ch. A	CM/LM	AM	Voice, CM to LM, EVA, data
259.700	Ch. B	CM/LM	AM	Voice, CM to LM, data
243,000		CM	AM	Recovery beacon
10.008		CM	SSB	Backup h.f. recovery link

Table 2.- Frequency Chart of Apollo/Lunar Module.

R.F. EQUIPMENT In several respects, r.f. equipment on the LM is much like that on its big brother Apollo (Note: Unlike military ships, astronauts don't refer to their spacecrafts as "she", but rather "he".)
The S-band assembly consists of two identical phased-locked receivers, two phase modulated (p.m.) transmitters (0.75 watt output) with driver and multiplier chains, and a frequency modulator (f.m.). The receivers and phase modulators provide the ranging, voice, emergency c.w., and telemetry trans-mit-receive functions. F.m. is primartly used for video transmission, but sccommodates pulse-code-modulation telemetry, biomedical, and voice trans-mission. F.m. also provides limited backup for both p.m. units.

When more r.f. is required amplifiers can be brought into play. This assem-bly consists of two amplitrons (prim-, 18,6 watts output; secondary, 14.8 watts output), an input and output isolator (ferrite circulators), and two power supplies all mounted on a common chassis. The r.f circuit is a series interconnection of the isolators and amplifiers. The amplifiers themselves (which are saturated, rather than linear) are broadband and exhibit high efficiency, high peak and average out-put power, but relatively low gain. The isolators protect both amplifiers and both S-band transmitter driver and multiplier chains. The isolators exhibit minimum isolation of 20 db. and a maximum insertion loss of 0.6 db. Only one amplifier can be activated at a time and when neither amp, is selected, a feedthrough path through the power amplifier exists with a maximum Insertion loss of 3.2 db.

V.H.F EQUIPMENT

Although the Apollo relies heavily on its S-band capabilities, the Lunar Module is oriented toward v.h.f. This equipment consists of two solid-state superhet, receivers and two 5-watt a.m. transmitters. One transmitter-receiver combination operates on 298.8 Mc. (Channel A), the other on 259.7 Mc. (Channel B), for simplex or duplex voice communications. Channel B may also be used to transmit pulse-codemodulation (p.c.m.) data from the LM to the CM at a low bit rate and to receive biomedical and space suit data from the astronauts who are outside the ship on the moon

SIGNAL PROCESSOR

The signal processor unit is the common acquisition and distribution point for most received and transmitted information, except that low bit rate split-phase data are directly coupled to v.h.f. Channel B and TV signals go directly to S-band f.m. The signal process or assembly processes voice and medical information and provides the interface to the proper r.f. generator, tape recorder, modulator, or computer,

This signal processor includes an audio centre for each astronaut and a premodulation processor where information is switched, mixed and modulated. It also has a repeater function so that v.h.f. received signals can be retransmitted on S-band

The two identical audio centres provide individual selection, isolation and amplification of audio received or transmitted from the LM. Each centre includes a mike pre-amp., headset am-plifier, VOX circuit, diode switches, audio gain controls, and an intercom

DIGITAL UPLINK

The digital uplink assembly decodes 2101.8 Mc commands from earth and routes the information to the LM guidance computer. It also provides a veri-fication signal to the pilots that the equipment has in fact received all the needed information from earth and got it in fine shape. However, if for some reason the computer doesn't get all the information it wants or it suspects some of it of being wrong, it will sig-nal through the S-band transmitter "no-go" and ask for a repeat. The uplink commands addressed to the LM parallel those inputs available to the LM guidance computer via the display and keyboard accessible to the spacemen The digital uplink assembly also provides another means of voice-backup if the received S-band audio circuits in the premodulation processor fail.

RANGING TONE TRANSFER.

The ranging tone transfer unit oper ates with v.h.f. receiver B and v.h.f. transmitter A to provide a transponder function between the command and the moon vehicle. The v.h.f. ranging tone input is made up of two acquisition tone signals and one track tone signal. Accurate ranging is accomplished when the track tone signal from the CM is received and re-transmitted from the I.M.

ANTENNAS

The S-band steerable antenna is a 26-inch diameter parabolic reflector with a point source feed that consists of a pair of cross-sleeved dipoles over a ground plane. Primarily this antenna provides deep-space voice and telemetry communications and deep-space tracking and ranging This radiator functions over 174 degrees azimuth and 330 degrees elevation coverage and can be operated manually or automatically Initial positioning is done manually to

(Continued on Page 17)

Information	Freq. or Rate	RF Carr'r Subcarr'r Subcarr Modulat'n Modulat'n Freq.
Receive: 2101.8 Mc.		
Voice	300 to 3000 cy.	PM FM 30 Kc.
Voice Backup	380 to 3000 cy.	PM FM 70 Kc.
Ranging Code	990.6 kilobits/sec,	PM 70 Kc.
Uplink Data	1.0 kilobits/sec.	PM 70 Kc
Transmit: 2282.5 Mc.		
Voice	300 to 3000 cy.	PM or FM FM 1.25 Mc
TV	10 to 500 cy.	FM baseband
Biomedical	14.5 kc. subcarrier	PM or FM FM 1.25 Mc
Lunar Surface Unit	3.9, 5.4, 7.35, 10.5 kc. subcarriers	PM or FM FM 1.25 Mc
Voice	300 to 3000 cy.	PM baseband
Biomedical	14.5 kc. subcarrier	PM baseband
Lunar Surface Unit	3.9, 5.4, 7.35, 10.5 kc. subcarrier	PM baseband
Voice Backup	300 to 3000 cy.	PM baseband
Ranging Code	990.6 kilobits/sec.	PM
Emergency Code	Morse Code	PM AM 512 Kg
Pulse-code-mod. non-return zero	High bit rate: 51.2 Low bit rate: 1.8	PM or FM Phase 1 024 Mc Shift

Table 3 -Lunar Module S-band Capabilities.

Useful Circuits Using Computer Board Transistors

RON RROWN * VK77RO

In the August issue of "A.R." was presented a set of characteristics of transistors from I B.M. computer circuit boards, showing typical values, with some indication of the spread of values to be expected. Although there may be some similarity between the transistors and certain commercial types (e.g. 2N1300 series for G33, G83, etc.), it is definitely undesirable to make any definite use of such similarities, because the evidence shows too wide a variation of some of the characteristics of the commercial ones.

The data hinted, but did not state, an interesting fact: the computer transistors are high quality items, likely superior to the "general purpose" germanium types generally available commercially. They are usually char-acterised by low leakage, low noise, and adequate gain-depending on type, of course. The power transistors (in the TO-3 case) have remarkable volt-age and gain ratings, with good linear-ity, and a healthy frequency rating.

The circuits presented here use some of the transistors from computer boards. Even though satisfactory performance has been obtained, it may be necessary to experiment further to obtain outimum results, depending on individual components. It will, in most cases, be possible to use transistors from the possible to use transistors from the condition of the con

215 Carella Street, Howrsh, Tas., 7918

A TUNING FORK OSCILL ATOR

This little oscillator was devised to enable the YF to tune her violin.1 See

Fig. 1. The fork used is a British Standard "A" (440 c.p.s.) which costs about \$1.
Reference should be made to previous articles in "Electronics Australia" and "Amateur Radio" for details of mount-

I-Reasons. No plane and I get tired of having QSOs interrupted by the YF weating to laten to WWY.

3-Jeffcoat, K. "A Tuning Fork Frequency Standard," "Radio, Television and Hobbies,"

2-VLSPS. PRIT'S the Easy Way." "AR.,"

ing Remember, however that the fork must be mounted rigidly with respect to the earpieces. The circuit of Fig. 1 is self-explanatory.

Ti and the speaker could well be replaced by a two-inch speaker and appropriate transformer (1 to 2K pri-mary impedance). Ri should be adjusted so that oscillation is maintained at just below clipping level.

The unit has now been operating quite successfully for several months. Output is quite loud enough for violin tuning, and frequency shift (checked against WWV) is undetectable.

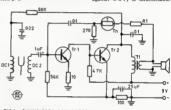


FIG.1, TUNING FORK OSCILLATOR

TR1, TR2-083, or GS4 (or GS3) if supply polarity reversed, as well as polarity of

19—Output feshaltermen from sucess, or annuar, newound with near me number or pulmary large flash of the pulmary type file.

Bit—Between 181 and 261 able the first.

Bit—Between 181 and 261 able the first.

Cit—To resource with DCI at operating independs for the DCI and DCI—One with DCI and DCI—One could not pulmary the pulmary of the Cit—To resource with DCI at operating independent.

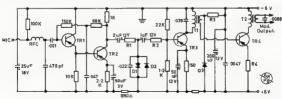


FIG. 2. A 3-5 WATT MODULATOR

Capacitances in sF. If not indicated apacifically, D1, D2, D3—Silicon diodes from boards, see text. P1, P2, P3. See text. P4—16 ohen wire, see text. P4—16 ohen wire, see text. P1 Oriver transformer, see text.

31/2 WATT MODULATOR

Fig 2 shows a transistor modulator which has now been in use for 18 months in a 6 metre mobile, the final

valve is a 6DL5.

The unit operates from a 50K ohms dynamic merophone. R1 adjusts the drive level to the clupper diodes, D1 and D2, which are silicon diodes from the computer boards, and matched for equal forward voltage at 5 mA. forward current.

Due to the low output voltage of the microphone used by the author, R1 was not required. R2 adjusts the modulation level

Ti was wound for the job, but it should be possible to find a commercial should be possible to find a commercial should be possible to the should be possible to the should be possible to the should be shoul

is adjusted by varying R3 until Is = 1.8 anps. If this requires reducing R3 below about 35 ohms, try a different diode for D3. R4 is obtained by using an appropriate length of copper or

4—These are the ministure glass-capsule type common on the boards, but some of them are silton, and some are germanium. An easy way to fall the difference between them is to measure the forward resistance of a diode known to be silton. Also works for translators.

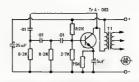


FIG. 4. PHASE SHIFT AUDIO OSCILLATOR FOR FOX HUNTS,

resistance wire, calculated from the wire tables, or by finding the ohms per foot from a long piece which gives a reasonable seeding on age and a reasonable seeding on age, and the seeding of the usual sort to bias the base of the ATI138, but I/3 also provides a measure of temperature compensation. The seeding of the usual sort to bias the base of the balance the characteristic of the output transistor, but that would require a bit of experimenting about the values of or experimenting about the values of reduce tendency to thermal runnway, and some negative are. feedback to improve quality. 338 or of 42 from the

If you have an 036 or 042 from the computer board, you can use it in place of the AT1138. Or inexpensive transistor types OC256, etc., can be obtained. If a very low-Z microphone is used, a common base pre-amplifier of conventional design would be appropriate.

TWO METRE TRANSMITTER

Although it is very simple, this little transmitter gives very good results, considering that the input power is only 250 mW. It has been built in two versions.

(a) As shown in Fig. 3, and (b) with the audio driver as a phase shift oscillator (Fig. 4) for a fox-hunt transmitter

TI is an OCT1 to 2 x OCT2 driver transformer, while T2 is an OCT2 out-put transformer with the secondary replaced by a centre tapped winding of about the same number of turns as the primary. The heaviest wire possible should be used, consistent with space available on the former. When reavailable on the former. When the St together a but a small air gap will be formed.

If it is desired to avoid the use of a speed transformer, an ingenious alternative system is possible with two diodes, as described on p. 96 of "Transsistor Transmitters for the Amateur," by Don Stoner. It is also described on p. 170 of "E.E.B." for Dec. 1987, with improvements.

Some trouble was experienced with transistor break-down in the 286 driver when modulation was applied; to avoid his, it was necessary to select a transistic processor of the control of the selection of the driver may increase with the reliability of the TO-18 types, because voltage rating decreases with temperature. I you don't have any temperature in you don't have any temperature in you don't have any temperature in you can be a selected as the selection of the processor of t

The 2B8 and 198 types are TO-18 planar transistors, characterised by high ft. The 150 series has low BV, thing ft. The 150 series has low BV, thing ft. The 150 series has low BV, the ft. The 150 series having an excellent TO-5 transistors having are excellent TO-5 transistors having are excellent TO-5 transistors having are excellent TO-5 transistors having for the following the first thing the transistors having with ft. of the order of 78 Mc; 48 Mc. would be asking rather a to from them in common emitter configuration. They would be selected to the first thing thing the first thing

A shield must be placed across the final transistor (between base and collector), and the input and output cir-

lector), and the input and output cir-5-The 133 series is also worth trying. Note that the resistance in the base of the drivet is low so that for all practice purposes. BV_{CST} equals BV_{CST}.

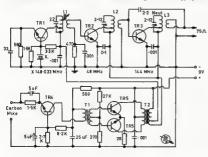


FIG 3 TWO METER TRANSMITTER Pin. 250 mW

TR1, TR2—288 or 2N3846 TR3—2N3848 TR4—083 TR5—071 088

T1 T2 See text

Colls. All wound with 18 a.w.g. Sined wire L1=9 turns is inch stag, ½ inch long, top at 4½ 2-3½ berns 3/8 inch diskm, 3/8 ench long, top at 2½ berns 3/8 inch diskm, 3/8 ench long, top at 2½ berns, link 1 turn.

L3—Same as L2 bet top at 1½ burns

Amateur Radio, September, 1969

cultry well isolated from each other. Good bypassing and short leads are imperative; thus, although the 0.1 uF, and 0.001 uF, by-pass condensers of driver and final are shown separated on the diagram (Fig. 3), the compact board (not shown) resulted in the two being very close together.

The neutralising of the final (if it proves necessary) is simple but effective, and is adjusted by varying the value of the 2.2 pF. condenser for best stability. The output link must be phased correctly. Neutralisation of the final will probably be required if a

transistor with low fr is used. With compact geometry and the components shown in Fig. 8, the transmitter was stable and performed well. The current literature is, however, full of warnings about dire effects of transients or parasities, and might be worth consulting if trouble is encountered.

Various cures are offered, The unit was built on a circuit board about 23" x 3". It was combined with an audio output stage (as shown in Fig. 5) and a super-regenerative receiver to make a small hand-held transceiver.

LOW POWER CLASS B COMPLE-MENTARY SYMMETRY AUDIO OUTPUT STAGES

The idea of using circuit board transistors and disposals high impedance speakers had, for some time, appealed 5-Recent issues of "QST," "Ham Radio" and Australian "E.E.B."

to me as an aconomical way of making low power audio output stages. In fact it proved possible to build one, complets with gracker for her the \$4

reproved pleasing to bound one, complete with speaker, for less than \$4.

Fig. 5 shows the details. For best results, TO-5 high current (\$00-400 mA. rating) transistors from the boards should be used. These are:

PNP: 030 and 026. NPN: 086 and 071.

Mine were matched on a Kyoritsu tester for $h_{\rm FS}$ and β within 20%. Even though the 086 should be a better match for the 030 than the 071, it was hard to find 086 mates for the 030s, so 071s

The pre-amplifier transistor can be any of the PNP TO-5 types (034, etc.), but note that I used transistors with β greater than 130; I suggest you do the

manner ommenced the design with a mathematical peproach (Ref. T. Davis, "Manivatt Digest," Vol. 2, No. 4, p. "Manivatt Digest," Vol. 2, No. 4, p. 5 more practical approach. I decided that the 500 was sufficiently similar to already published designs (Ref. "Minialready published designs (Ref. "Miniwatt Digest," Vol. 3, No. 3, p. 33-44) and to make any modifications required, with layout, is shown in Figs. 5, 6 and 7, monthly of the sufficiency of the model of the sufficiency of the sufficiency of the and 7, monthly of the sufficiency of

After wiring, check, and switch on. Measure the voltage, Va and the collector current of the 630. Va should be as given in Table 1, and the collector current should be between 1 and 3 mA. If not, adjust R4, or if 3

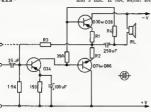


FIG 5, LOW POWER AUDIO AMPLIFIED

Voltage, E Volts	R _L Ohms	Po* mW.	V _A Volts	R1, R2 Ohms	R3 Ohms	R4 Ohms
6	8	130	3.6	3.9	4,7K	470
8	15	300	4.0	3.3	6.8K	820
12	27	450	6.8	2.7	5.6K	560
18	33	700	10.0	1.5	9.1K	1000

Input Impedance: Approximately 30 ohms at 1 Kc.
Frequency Response: 3 db. down at 250 c.p.s. and 150 Kc.

* Power output at the onset of clipping (at 1 Kc.)

c.r.o. is available, adjust for equal positive and negative clipping at maximum output For best results, R3 will also need slight adjustment. With the low voltage versions, power

With the low voltage versions, power dissipations should be acceptable at normal ambient temperatures, but with the l8v. version small heat sinks should be fitted. These can be made easily by cutting I" lengths of aluminium tubing from an old tv. serial and pushing them over the transistors (for tight

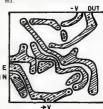


FIG. 8 -BOTTOM VIEW (Actus: 8126)

As it stands, the circuit has a large amount of a.c. feedback from V to the base of the 034 via R3. If this is undestrable for your application, it can be removed by dividing R3 in two, and by-passing the centre. The low frequency cut-off point of 280 c.ps. is limited by the 25 uF. condenser; if you want lower frequency response, increase its value.

All units performed satisfactorily, except that there was a small amount of crossover distortion with the 6-volt version.

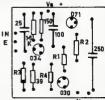


FIG 7.—TOP VIEW (Actual S 20)

DIODE SWITCHING A REMOTE CONTROLLED 3-CHANNEL

6 METRE MOBILE

Due to the fact that my 6 metre
mobile is remote-controlled, the addition of two extra channels presented

quite g problem. Relays and step switches were considered, but in the end it was decided to try diode switching, mainly due to cost.

My first attempt used 100K resistors from the h.t. line but not all crystals could be made to oscillate reliably, because the r.f. rectified by the diodes probably tended to turn the crystal off. Increasing the "on" current to the diodes to about 40 mA. each solved diodes to about 40 mA. each solved the problem, but the h.t. power supply was unable to provide the extra 80 mA. needed. This was solved by sup-plying the diodes from the l.t. line (6v.). This turned the crystals on reproducably, but resulted in interaction be-tween the two sets of crystals by coupling through the low resistances used The final method isolated the two sets of crystals with r.f. chokes, as shown in Fig. 8.

Due to the fact that there is a large amount of circuitry at grid potential, it is necessary to be careful with the layout and shielding. For the same reason it is inadvisable to use more than three sets of crystals. The 56 µH chokes might be larger, but they were readily available from the computer bosn'ds (green body, colour coded; or brown body, lettered); occasionally larger chokes may be found on the boards

For 12v. supply, increase the values of the 82 ohm resistors to 180 ohms or 220 ohms; incidentally, the 82 ohm re-sistors also came from the boards 50 mA, might seem on the high side for the germanium diodes, but as this unit has been working for nearly 12 months, this current level can be regarded as satisfactory. As Leo VK7RG points out, if this was too much current the diodes would not take it for long. It is worth noting that if a germanium diode does not get more than moderately warm, it will take a given current indefinitely at a given room temperature. For the same reliability a silicon diode can get hot enough to hurt the touch. Be sure start (see reference 4).

I wish to thank R. L. Gunther. VK-7RG, for his assistance in preparing this manuscript.

Silver Plating of V.H.F. Inductances

A. S. LUNDY. VK2ASI

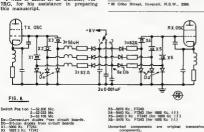
Reference is often made to the use of silver plated inductances above about 50 Mc., but unfortunately the average Amateur has the problem of getting small "one off" jobs done.

VK2ASI has been plating his v.h.f. inductances for several years now since building a 2 metre a.m. portable rig for a field day. This rig used a final that required 3 mA. of grid current across a 15K grid resistor Upon firing up the rig, the usual 2 metre problem arose—not enough grid drive. In fact, only 2 mA.! 1 mA. short. What to do! The induclances were wound with bare copper wire, so three colls were removed, one at 48 Mc., and two at 144 Mc. from the driver stages. These were silver plated and then installed back into the rig and, without any alterations to the circuit, except for a slight retune, 3 mA, of grid current was obtained. Success!—and now how to

An essential requirement in silver plating is that the electrolyte used must contain a very low concentration of silver ion. A solution of silver nitrate for instance would be unsuitable, as all the silver would be present as silver ion. This would cause the silver plating to be non-coherent and it would fake off.

The electrolyte of choice is Potassium Argentocyanide solution. In this solu-tion the argentocyanide ion is in equilibrium with only a very small amount of silver ion, hence the con-centration of the silver ion Ag+ is low, nearly all the silver being present as argentocyanide ion [Ag(cn)].

To prepare the Potassium Argentocyanide solution dissolve 17 grams of silver nitrate in about 200 Mls. of distilled water or rain water, and 6 grams of sodium chloride in 100 Mls. of water. Upon mixing these two solutions, a white curdly precipitate of silver chloride will form and settle to the bottom



commonnents.

as a coherent mass. Decant the excess water off and wash the precipitate twice by adding 200 to 300 Mls. of water and decanting

The silver chloride is quite heavy and no trouble should be experienced in keeping it at the bottom while decanting. Add about 300 Mls. of water to the precipitate and leave where it will not be in direct sunlight or it will decompose,

Now dissolve 14 grams of Potassium Cyanide in 200 Mis. of water and add about three quarters of it to the silver chloride, most of which will dissolve Add small amounts of the cyanide solution to the silver chloride with stirring until all the silver chloride has just dissolved. Dilute to about 1 pint which should be sufficient for most jobs. The solution is extremely poisonous, a sossible care must be taken with it.

The work to be plated is made the cathode of the electroplating cell (negative voltage applied to it) and the anode is a piece of silver of at least 95% purity and about one inch square. A voltage of 6 to 12 volts at a current of 1 to 2 amps. is required depending on the size of the object being plated. Too high a current will cause an effervescence at the work and the silver plating will be porous and will rub off. If this occurs, the current must be reduced either by lowering the voltage or if this is fixed (I use a battery charger) by increasing the dis-tance between the work and the anode.

Silver ions are discharged at the object being plated, while cyanide ions are discharged at the silver anode. These combine with the silver to form silver cyanide which then dissolves back to potassium argentocyanide. This means that the electrolyte never "wears out", silver is simply transferred from the anode to the work.

LEBANESE DX CONTEST

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Design of a Three-Band Beam for 28, 21 and 14 Mc.

B. SYKES.* G2HCG

E XPERIMENTING with antennae can be lots of fun, but when the final design must be suitable for massproduction and eventual use in all parts of the world, in all climatic conditions, the fun element tends to disappear. Nevertheless, the story of the problems involved and the methods used to achieve final success can still provide entertainment especially as, regardless of the amount of laboratory work in-volved, the final tests must be "on the air"

REACTANCE COMPENSATION The basic objective was to produce

a three-band beam with a performance on each band as good as a single-band beam. As always with antennae de-signs, the objective appeared to be quite impossible. A correctly designed single-band beam can be expected to singie-band beam can be expected to operate satisfactorily throughout the whole of any one band with a possible exception of 10 metres. The match will normally fall off at the edges of the band, but even this can be compensated for on a single-band beam by suitable reactance compensation.

Briefly, reactance merely means the Eriety, reactance merely means the effect of mis-tuning, and normally if, for example, a dipole is operating h.f. of resonance it will have an inductive reactance, namely it will look like an inductance. Similarly, if the dipole is 1.f. of resonance, it will have a capaci-tive reactance. Now all that is necessary to bring the dipole back on tune is to apply the opposite amount of reactance and, if this reactance can be made to vary with frequency inversely to that of the dipole, then it is possible to provide compensation and the antenna remains on tune over a much larger bandwidth than normal.

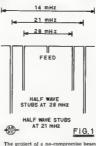
These principles of reactance com pensation may be applied quite simply to single-band beams by the use of stubs, etc., but the possibilities of reactance compensation on a multi-band beam seem almost impossible and, in fact, most designs of multi-band beams have a considerably narrower band-width on any one band than an equiv-alent single-band beam.

TRAP DESIGN

Trap design is the fundamental in all multi-band beams and trap per-formance may be divided into two parts. Firstly, the characteristics at resonance where a high degree of isolation is required, and, secondly, but possibly a more important characteristic and one which is so often ignored, namely, that of trap performance on the bands other than the resonant frequency.

With the thought in mind that it might prove possible to provide a measure of reactance compensation by means of the off-resonance character-istics of traps, various trap configura-tions were considered. The normal type of trap using a resonant coil and "J Beam Engineering Limited, Northhampton, England

capacitor has reasonable characteristics at resonance, although the bandwidth tends to be inadequate. The performance on other than the resonant band however, left very much to be desired and, far from providing reactance compensation, this type of trap was making the situation worse, resulting in very limited bandwidth characteristics of the antenna as a whole. Consideration was then given to the use of a quarter-wave stub, but although the resonance characteristics appeared to be improved and a better bandwidth could be expected, the off-resonance characteristic was still the opposite to that required for successful reactance compensation.



nearly foundered at this point and designs were actually in hand for a standard type of three-band beam using well known principles of trap design Little enthusiasm existed for this antenna as not only did it not meet the specification, but it offered no more than existing commercial designs.

USE OF HALF-WAVE STUB

The usual British winter weather took a hand here and kept the laboratory antenna testing staff indoors with little to do but think, and suddenly the thought arose why not try a halfwave open stub as a trap? Consideration of the theoretical aspects of this idea showed considerable promise, not only that bandwidth would be adequate at resonance but reactance swing appeared to be in the correct direction at last to provide compensation against the reactance swings of the antenna Theory indicated therefore that re-

ctance compensation was possible, but to achieve an exact balance in practice

was quite another thing Calculation of the reactance characteristics of the half-wave stub was no problem what-ever, but calculation of the feed characteristics of even a three-element yagi borders on the use of computer techniques and some practical work seemed to offer a far quicker solution

Tests on full size antennae at 14 Mc are expensive and time-consuming and the results, bearing in mind the proximity of the ground and nearby objects, are unlikely to be reliable and repeatable. Tests were therefore carried out at 10 times the operating frequency namely at 140, 210 and 280 Mc. On these frequencies, using a sweap gen-erator, it proved possible to display on a cathode-ray tube screen the complete matching characteristics of the antenna on all three bands simultaneously and thus, not only would it be possible to see the effect of adjustments of the traps at their resonant frequency, but also the effect on the other two bands.

It proved possible to produce a highly efficient three-element yagi operating on 140, 210 and 280 Mc. and measurement of the bandwidth in practice showed that reactance compensation had indeed been achieved on the two lower frequency bands, but not at the highest frequency. The reason for this is of course that, at the highest frequency, namely 280 Mc., the 280 Mc. trap is behaving correctly as an open circuit and to all intents and purposes, the rest of the antenna does not exist On 140 Mc., however, both the 216 and 280 Mc. traps are in series with the antenna elements although they are not resonant at 140 Mc. The off-frequency trap compensating properties therefore operate and the match obtainable on the final antenns at 14 Mc. was almost too good to be true: in fact better than 1.1/1 from 14.0 to 14.4 Mc. At 21 Mc., there is still compensation from the 28 Mc trap which is in circuit but of course off-frequency, and although the match is not as phenomenally good as on 14 Mc., there is still coverage of the entire band at better than 1.5/1. On 28 Mc., there is no reactance compensation since, as previously stated, the traps have shut off the rest of the antenna, but nevertheless it has proved possible to obtain a match better than 1.6/1 from 28.1 to 28.7 Mc. Fig. 1 shows the schematic of how the three-band dipole finally looked using the halfwave traps.

MECHANICAL DESIGN The next problem was one of mech-

ics on how to accommodate this type of trap to a practical waterproof design. The necessary properties are strength, lightness, resistance to weather and good electrical power factor. No one material is capable of providing all these properties and it proved necessary to use fibre-glass for strength and lightness together with polythene for insulation and good power factor The half-wave stub was composed initially of 72 ohm flat-twin transmission line and attempts to place this loosely inside the radiator tube were doomed to failure due to uncontrollable capacitive effects. It was, however, found that the half-wave stub could be wound into the form of a coil without adversely affecting the electrical properties. Unlike a coil, however, there was no large external field, in fact the winding could be on metal with little effect, or it could be inside a metal tube without the adverse effects which occur when a normal coil is placed inside a close-fitting screening con

The fact that the stub could be placed inside a tube led to the obvious conclusion that the best place for it was inside the antenna elements and the final configuration is illustrated in Fig. 2, where there is complete protection against the weather for the stub and the strength of the join is provided by the fibre-glass joint piece.

wavelength at 28 metres, giving a boom length of some 16 feet and a spacing on 15 metres of 0.185 wavelength, and on 10 metres of 0.25 wavelengths.

The increase on spacing on the two higher bands is particularly advantageous in this design since, on 20 metres where spacing is closest, there are two traps in use to provide reactance compensation, and on 15 metres, where the effective spacing is larger requiring less compensation, there is only one trap in use, and on 10 metres, where no re-actance compensation is possible, the spacing is effectively quarter-wave and a three-element quarter-wave spaced beam has a dipole feed impedance of virtually 50 ohms with no problems

The question of a balun was then considered and although it proves very difficult in practice to measure the difference between antenna with a balun and one without, the no-combeam gain of 5.8 db., but a daily sked with VEXIN, using instantaneous switching between the beam and the dupole, showed a consistent 3 S points improvement with the beam and this was repeated on similar skeds with WASBEN. Three S points is 12 to 18 db., which is quite impossible to achieve from a three-element beam, but this amount of DX gain quite definitely does exist. Since this initial design was a three

and the dipole showed the theoretical

beam gain of 5.8 db., but a daily sked

element to cover three bands, it was decided to name it the Triple Three, with the possibility of a family of Triples reaching to Triple Fours and Triple Sixes in the future. Doubts exist on whether it will be possible to achieve the same amount of reactance compensation with a 4 and 6 element beam and in any case, lots of headaches are in store from the mechanical standpoint in that a six element must have a wider spacing than one-eighth wavelength with consequent problems in boom design which will undoubtedly need to be larger than the present 2", bringing in all the attendant problems in the design of new fittings.

Sincere thanks are due to VK2NN, WASBBN and G3OUJ for their patience in providing the other end of the final test range, where business became pleasure.

WEATHERPROOF SLEEVE -ELEMENT STUB WOUND ON-FIBRE GLASS JOINT PIN INTERNAL COIL FIG. 2 FORMER

The mechanical considerations of the final design now had to be considered. A half-wave element on 20 metres is quite simply and logically 10 metres long and the no-compromise design of the traps meant the dipole would in fact be half a wave long, namely 33 feet. This length of element has to be supported in the centre and, assuming it to be made from 1" diameter tubing the total area is just under 3 square The wind pressure at 100 m.p.h., allowing for the circularity of the ele-ments, is 25 lbs. per square foot, and thus a 1" slement at 20 metres will have to be designed to withstand 75 lbs. of wind pressure.

The total wind pressure on a threeelement array including the cross-boom will be approaching 300 lbs. The ob-vious method of reducing these stressis is to taper the element, thus reducing wind pressure on the tips where leverage is greatest. Cost considerations dictate that the taper must be in the form of steps and it is convenient on a three-band beam to step the element size down at the point of insertion of a trap. Total wind pressure by this means is reduced to approximately 200 los. at 100 m.p.h., but even so, to pro-vide an adequate margin of fatigue resistance, a 2" boom is essential.

SPACING AND FEEDING

On 20 metres, a spacing of one-eighth wavelength results in a reasonable sized antenna, but due to the close spacing, the Q is high and the provision of adequate bandwidth and match is very difficult. With reactance compensation, however, the high Q of the close-spaced beam proved to be an advantage as is shown by the almost perfect match obtainable throughout the 14 Mc. band, It was therefore decided to standardise on a spacing of one-eighth

promise thoughts definitely dictated the use of a balun, if only to reduce t.v.i. problems due to radiation from the feeder. The only possible type of balun which would not upset the careful impedance balance which had been achieved was a non-resonant device and design was finalised on the modern ferrite-ring balun which could easily be incorporated in a waterproof connector box.

A word of warning is perhaps appropriate here in that one particular type of ferrite strongly recommended in magazines proved to have utterly unacceptable losses which appeared in the form of heat and a rising mis-match when power was applied to the antenne. Investigations had to be undertaken into the properties of ferrites and the correct type for this particular application was finally found and both the traps and the balun will withstand continuously 1 kw. of c.w.

GAIN ACHIEVED

Tests of short distance free-space gain showed that the theoretical maximum of 5.8 db. over a single dipole was achieved and it is interesting to wonder how some quoted gain figures for three-element beams of 8 and 10 db. can possibly be justifed. The an antenna system which depends mainly upon angle of radiation, thus considerable advantages must accrue from the use of the beam which cannot waste power upwards, as with a long wire or dipole.

It is difficult, however, to justify any umerical statement of this DX gain. but there can be no doubt that it exists in fact tests were carried out using dipole as a standard of comparison. Locally, tests of gain between the beam

PROVISIONAL SUNSPOT NUMBERS

MAY US ependent on observation at Zurich Observa-



Mean equals 120.0. Smoothed Mean for November 1968: 110.0 ~Swiss Federal Observatory, Zurich,

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Modifications to the No. 10 Crystal Calibrator to use 3 Volt Filament Supply

P DAW . VK24GI

The diagrams show the power supply I used and the modifications made to the No. 16 Crystal Calibrator to oper-ate it from 3 volts d.c. filament supply-

The most difficult part of the job is disconnecting R19 from the earth lug. I used heedle nosed pliers and care-fully bent the wire back and forth where it was soldered to the lug until where it was soldered to the lig until it broke. Then I lengthened the re-sistor pigtail by soldering a wire to it with a small iron and insulated the lead with spaghetti tubing. I removed the screw holding the solder lug and mounted a piece of bakelite under it which extended to the large hole along-

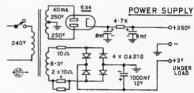
An cyalet was placed in the bakelite An cyclet was placed in the bokeness and centered in the hole so that it would not short to the chassis and the pigtail of R19 soldered to this. An insulated link connected to points 1 and 2 (L11 and L2) completed the modification.

Three volts positive is applied to the large pin on the front panel instead of 12 volts.

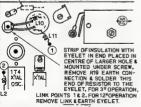
The power supply showed slight hum when using the calibrator, but was not excessive. A larger capacitor in the l.t. filter would probably improve metters

* 'Woodlands," Wombat, N.S.W., 2500

ORIGINAL CIRCUIT L11 910 PV1 R20 22n 6n 30.0 4-7K 2501







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LA.R.U. REGION III. NEWS

The W.I.A. Director, John B. Battrick, VK3OR, has written to all Region III. Amateur Societies inviting them to join the Association A complete outline of suggested activities with a conv of the interim constitution, provides a complete picture to the Region III. Association.

LT.U. CONFERENCE

The agenda for this conference was listed in the August issue of "A.R." and the I.A.R.U. Hdgrs have stressed that it is important for I.A.R.U. Societies officials to allow a mutual exchange of information.

The Region I. I.A.R.U. conference, as reported below, wish to achieve a mutual aim of expansion of Amateur space privileges generally for frequencies above 28 Mc. The resson for wanting this clarification is that I.T.U. regulations state that Amateur space activities shall be permitted between 144 and 146 Mc. This has been interpreted by some administrations as prohibiting activity on other frequencies

I.A.R.U. and Region I. feel that Amateur space communication (satellites and mocnbounce) should be permitted in all bands above 28 Mc. It should be the aim of all Societies to take up their question with their administrations, whether the result is a series of permissive footnotes to each Amateur band involved, or a change in the definition of the Amateur Service as contemplated by U.S.A.

At the proper time Headquarters will apply to I.T.U. for admission of the International Amateur Radio Union to the Conference in observer status. Ob-servers from U.K., France, U.S.S.R. and U.S.A. are likely to be present as members of their respective delegations.

REGION I. CONFERENCE

During the week of May 4-10, Region I. Societies met in Brussels and dis-cussed matters of reciprocal liceusing, Amateur Radio in developing countries, intruder watch and representation at the forthcoming space conference. 1970 will be the first year of a new

asio will be the first year of a new system whereby one of the European contests (e.g. W.A.E.) will be the nuc-leus of a larger DX contest sponsored in the name of Region I. The Badlo Sports Federation of the U.S.S.R offered to provide the major trophy.

A world-wide set-up of 10 and 15 metre beacons was endorsed by the Conference G2BVN is co-ordinator. Promotions programmes will be undertaken to create a widespread interest of Amateur Radio among citizens of developing countries.

NEW MEMBER FOR REGION III.

The Western Samoa Amateur Radio Club has been approved by Member Societies of the LA.R.U. The Secretary is Ron F Scager, P.O Box 498, Apia,

Call Signs in the Territories

Federal Secretary. Wireless Institute of Australia Box 2611W, G.P.O., Melbourne, Vic., 3001

As you know, amateur radio stations licensed for operation in the Territory of Papua-New Guinea and other ex-ternal territories other than Antarctica have hitherto been assigned call signs prefixed by the letters "VK" followed by the numeral "9" and two or three other letters of the alphabet.

As a result of a review which was made recently of the call sign position in the areas concerned, it has been decided to re-arrange the "VK9" series to provide distinctive call sign groups for each of the territories in question.

Accordingly, as from 1st July, 1969, full privilege amateur stations authorised for operation in the territories concerned will be allocated call signs from within the particular group set aside for the area in question as indicated hereunder: (a) Papua-New Guinea— VK9AA — VK9MZ

- (b) Norfolk Island— VK9NA VK9NZ (c) Christmas Island-
- VK9XA -- VK9XZ (d) Cocos Island-VK9YA -- VK9YZ (e) Other territories under

Australian jurisdiction-VK9ZA - VK9ZZ Call signs for limited amateur sta-tions will be allocated on the same basis except, of course, that the suffix letters will be preceded by the letter

Notwithstanding the abovementioned alterations in call sign arrangements, however, in view of the significance which many amateur station licensees attach to call signs, particularly in cases where they have been employed for a long period, no licensee will be required, at this stage, to forego an existing call sign which does not conform with the new allocation plan unless he makes a specific request for such a change.

It would be appreciated if you would be good enough to arrange for information concerning the abovementioned matters to be included in your monthly journal, please.

Yours faithfully, C. Carroll for Director-General.

JAMBOREE-ON-THE-AIR Most Amateurs are aware that this

event is to take place world-wide over the week-end of 18th and 19th October. Have you thought of setting up a link ation in a Scout Hall? VK3ASC station in a Scout Hall? VK3ASC expects to operate, over the whole 48 hours if more volunteers come forward, from a Scout Hall in the Heidelberg district. Any Amateur from the Heidelberg district who can offer assistance will be welcome and should contact Syd VK3ASC on 45-3002 (after 6 p.m. most evenings) or 69-0300 ext. 200.

"Said the Spider in the Sky" (Continued from Page 8)

orient the steerable antenna within ±12.5 degrees (capture angle) of the line-of-sight signal received from the earth. Once the antenna is positioned within the capture angle, it can operate in the automatic mode within the limits of its gimbal mount.

In flight, two omni-directional S-band antennas can be used; one forward, one aft on the LM. The radiators are right-hand polarised helicals that collectively cover 90 per cent, of the sphere at -3 db. or better. As mentioned earlier, bolic surface reflector that is unstowed from a side compartment of the descent stage after landing.

The two v.h.f. inflight antennas are also omni-directional right-hand circularly polarised radiators. An 8-inch conical monopole with 12-inch radials is used between the LM and the spacemen equipped with the PLSS. monopole is mounted on the top of the LM and is erected by an astronaut after landing the LM.

Summing up the communications system aboard the Lunar Module, it might be said that flexibility is the by-word, for in nearly every respect, redundancy of function has been "en-gineered-in". Without waxing too poetic, it might

be said that despite the superficial ugliness of America's "Spider in the Sky", its real beauty "lies in the harmony of man and his industry" that it reore-

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Amateur Radio, September, 1969

Western Samoa

AMATEURS LOCATE MISSING AIRCRAFT

On Thursday, 17th July, 1969, a light increaft with five people on board was according to the people of board was the position as being near Arward at about 2100 bours. The following morning a search alcord; spotted what any three-quarters of a mile south west of the felevision transmitting tower at The staff at the National television station were informed that it was posform be transmitting site and of the form the transmitting site.

Three local Amateurs figured prominently in the ensuing search, these were: The Officer in Charge of the National Station, Harvey Lelliott, VK3ZC; staff members, David Giles, VK3ADS, and Neville Maddern, VK3AAQ.

After a discussion at the station, the O.I.C. decided that, as it was unlikely that there would be any search parties operating in the area for some time, a search could be instituted using station staff. Using VESADS' car equipped with a metre f.m. equipment, VESZG care to the control of the probable crash size. DS set off for the probable crash size.

Before leaving they had carefully studied a map of the area and worked out, with astonishing accuracy, the probable position of the wreckage. VK3AAQ, in Ararat, was contacted by phone and requested to make radio contact with VKXAIDS. Within five minutes of receiving this request, contact was made between the two mobiles contact could be maintained in the search area, the Ararat Police were advised that VKZAAQ was in radio variety to the contact of the contact stage, the Police had cars moving towards the area but advised that the speed place was not certain that what purposes the contact of the contact of the place.

Approximately half an hour after the initial contact, VK3ADS reported that they had located the wreckage and two bodies had been found. VK3ZG remained with the wreckage and continued the search for the missing people while VK3ADS drove back to the main mountain road to direct Police and rescuers to the scene as well as marking the route to be followed for any VK3AAQ, meanwhile late arrivals. notified the Police by phone the details thus far, which they were then able to pass on to their cars which had still not arrived at the area. Contact was maintained between the two Amateur Stations until the Police arrived and established that they could maintain radio contact with the Ararat Police Station from the scene of the accident The Amateurs' job was then completed and both stations closed down.

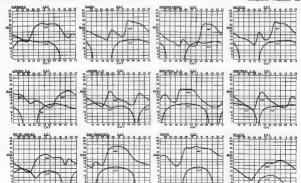
At this stage it should be pointed out that, although the traffic was carried by two Amsteur stations, there were two other stations standing by ready to play their part if required. These two were Stan VK3SE at Ballarst and Ted VK3ZQA in Ararat.

The operation went off very smoothly and should be worthy of recording that once again Amateurs were ready and able to provide communication when the need arises

Perhaps it should also be mentioned that the Amateurs' participation was entirely on their own initiative, they were not requested to render help by any authority. Just how much +lma they saved the authorities is difficult to sauge, but as there was no communication between spotter plane and ground parties, it is quite possible that several hours could have been saved. Had anyone survived the crash, this time could have meant the difference between life and death. By the time Police and rescuers arrived at the scene, VK3ZG had located two more bodies and VK3ADS then located the fifth and and VK3ADS then located the fifth and final victim. The part played by VK3ADS and VK3ZG must surely be worthy of recognition, but anyone who followed the press and radio coverage, would not have known the part these two, and Amateur Radio, played in the drama.



(Prediction Charts by courtesy of ionospheric Prediction Service)



New Equipment

PIC RE SWITCH



Switching of r.f. power can now be done quickly and safely, with minimum r.f. power transfer, the Fire Polyswitch, now available from Bail Electronic Services. Designed for higher load-carrying, they are capable of handling construction, with allway plated contacts, these switches are sealed against dust and are easily mounted; will take standard FL258 co-ax. connectors. Two models are thousieffly for the safe and the

single pole, 2-positions.

Further information may be obtained from Bail Electronic Services, 60 Shanon St. Box Hill North, Vic. 3129.

EDDYSTONE EC10 RECEIVER



R. H. Cuaningham Pty. L4d. have released the inlest product from Eddystone, the EC10, transistorised communications resolver Designed for commercial and Amsteur use, the EC10 stons and is light in weight. Fito is required to the continuous covrage from 360 kc. to 30 Mc., including 1500 kc. to 30 Mc., including 1500 kc. to 3000 kc., and six Amsteur bands from 160 metres to 10 metres.

bands from 180 metres to 10 metres. Features include built-in speaker, bfo. and a flywheel-loaded tuning knob controls a gear drive with a reduction ratio of 110 to 1. Power is derived from six U2 type batteries housed in a separate detachable compartment. An alternative ac., power supply is available if required. Housed in a metalcabinet, the EC10 is of robust construction and finished in an attractive twotion and finished in an attractive twobrochure is available on request. List price, \$179.40 plus sales bax where applicable. A.c. power supply extra. Further information from R. H. Cunningham Pty. Lid., 608 Collins Street, Melbourne. Viv. 3000.

A P P CATALOGUE

The new 1969-70 A & R-Soanar Group catalogue of power supplies, transformers and chokes is now available. Comprising 26 pages of technical data and specifications, the catalogue features a wide range of transformers and chokes, with a detailed stock price

A section is devoted to power supplies which Include precision and regulated types to meet applications for laboratory, commercial and Amateur use. The catalogue is available free and enquiries should be directed to A & R Electronic Equipment Pty. Ltd. 42 Lexton Rend. Box Bill. Vic. 3128.

RAPAR MIII TIMETERS



Available from Radio Parts Pty. Ltd. is a new range of multimeters to suit many applications for commercial and Amateur use. Branded Rapar, there are six models priced from \$3.00 for the six models and the six models are featured in Radio Part's advertisement elsewhere in this issue.

150

CORNISH AWARD

This award is issued by the Cornish Radio Amateur Club for working stations in Cornwall, England in three classes.

European: Class I. 30 points; Class II., 20 points, Class III., 10 points.

Non-European: Class I., 15 points; Class II., 10 points; Class II., 5 points.

Rach different Cornish station counts one point but same station worked on a different band also counts.

QSL cards need not be sent but log data must be confirmed by two licensed Radio Amateurs or by an officer of a National Radio Society.

C.H.C. all directory rules apply AOMB/M ree disabled and B/P Aveilable to Swl's Apply with G.C.R. and 5/-, 31 or eight IRCs to twardt Manager, Ted Bowden, GZAYQ, "Al-acy House," Goonowall,

ADDITIONS TO BOARD OF DIRECTORS

Hy-Q Electronics, of Frankston, Vic., an independent quartz crystal manufacturer, has announced the following additions to their Board of Directors.

Mr. D. H. Rankin, M.L.E. (Aust.), A.M.I.R.E.E. (Aust.), has been appointed Technical Director. Mr. Rankin, a fully qualified Chariered Engineer, has had a long association with a prominent crystal manufacturer as Chief Crystal Engineer.

tion with a prominent crystal manufacturer as Chief Crystal Engineer.

He has travelled extensively and has attended many important Crystal/Frequency Symposiums in the U.S.

Mr. R. W. Taphouse has been appointed Manufacturing Director.

pomed Manuacturing Literary.

Mr Taphouse was formerly Manager
of the Crystal Division of a prominent
manufacturer and has many years of
experience oversess in the crystal manufacturing industry in a senior production consecutive.

CHASSIS HOLE PUNCH

A sheet metal punch that will cet holes in steel and aluminium up to 16 gauge is now available in a range of astee for hole diameters from \$6° to 1-1.4°. Branded Q-Max, these metal control of the contr

Further information from R. H. Cunningham Pty. Ltd., 608 Collins Street, Melbourne, Vic., 3000.

W.A.V.K.C.A, AWARD
The following Ameteurs have received this ward during the period 1/7/88 to 30/8/89:

				received this
Award	during th	e period	1/7/68	to 30/6/89:
Cert. N	io. Call		Cert. N	o. Call
337	ZLINV		334	UBSKDS
238	JA736A		366	ZLERK
239	KRSTAB		256	JASCZ6
240	ZLAJU		387	JARLA
341	UAORV		358	JAINDO
342	JAIFT		359	ZLIAMN
343	SMOATN		360	GW4NZ
344	ZLION		361	WHSIUH
343	OUZ		365	JAIOCA
346	OKIMP		268	JAIMIN
347	ZLEQK		364	VP7NH
348	JA2JKV		288	W4UAF/KH8
349	KRSKQ		366	UAJUJ
230	VPTNA		367	UBSMZ
351	JAIAKH		286	GMSCFS
353	VESFO		309	KAAUL
363	DLIME		270	SCOTINAL

VK S.W.L. D.X.C.C. AWARD

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WIA-L3042	Eric Trebilcock
WIA-1.2022	Don Grantley
WIA-L3811	Warwick Smith
WIA-LADIS	Chas. Thorpe
WIA-1,5080	Ernie Lasff
WIA-L3228	Bob Halligan
WIA L8921	Peter Drew
WIA-1.2283	Bob MacIntosh

2. WIA-L5088 Steve Rendiger 1909 18. WIA L3185 Brisn Hannan 1869 (All enquiries to Eric Techlicock (WIA-L5043), S.w.l. Awards Manager for VK, 340 Gilles Street, Thornbury, Vk., 2871.)

Overseas

Magazine Review

Compiled by Syd Clark, VK3ASC

"BREAK-IN" June 1969

June 1666 H.F. Seam, ZLASS This beam operation is a two selected to a next size money and an extraord to a next size many the foreign selected to a next size many the longest element is about 36 feet long. The boom is made from two sixteen foot lengths of 2 x 1/s inch oregon. Tuning the lengths of a x 1/s inch oregon. Tuning the lengths of a x 1/s inch oregon. Tuning the lengths of a x 1/s inch oregon. Tuning the lengths of the size of the length Simple Beam Retailer, ZLIAYT, A "hand-raulic" system rotated by leaning out the window to swring the beam around. The beam in this case being a 3 metre six over six skeleton sixt type. V.M.F. Antennas, ZLITFE. Describe the utual types of v.M.f. beams and methods of matching.

All All-Band Transmatch, ZL1FS The author All All-Band Transmatch, ZLIFS The author means all ht. bands.
The 31 db. Two Meire 31y Beam, ZLATAH. This is a different type of long yags and the name comes from "Suspended Long Yagi" because the beam is made up ladder fashion from aluminium tubing and srtificial fibre oroging. It folds into a neet bundle for trans-oroging. It folds into a neet bundle for transport. Hems-Braw Hellwhip, ZLEQR The interesting thing about this eight if: helical whap is that it has a matching section at the bottom prich of the winding diminishing from 3 to 1/8 inch before going into the close-wound section. The author claims this technique increases the impedance from about 20 to around

50 when Compling the Co-ax, is the Antenna, Some interesting ideas for coupling the co-ax, and a dipole at the centra. Tigs on Tuning a Beans, W&BLZ. The issue is completed by all of the usual features.

"CQ" May 1969-The front cover describes this as a "Special Surples Issue". Do not give it away at this stage for what they mean is that it is especially devoted to the modification of Disposals infly accorded to the mediciation of Disposate Park ARCS, desirety Transmiss, WIDDYR The ARCS, desirety Transmiss, WIDDYR The ARCS, desired to the second of of ministure tubes and an SSFA
Pating the URC-1: on 210 Mc., WITFA A
nmall hand-held walkie-talkie type equipment
for operation on our shortest var. wavelength.
Pating the Motorels B304/U FM. Baselver
on Two Motres. W671T must have a whole
station made up from "surplus" Re-inking M.T.Y. Mibbons, WHINK To think always thought they used standard typewriter libbons. That shows how much I know about Two Metre F.M. with the ARC 5, WHAZ The Two Metre F.M. with the AMC 5, which has until described here was never seen in quantity on the Australian market.

A Power Supply for the UEC-4 and UEC-11.
Modern solid state circuitry to replace those Modern solic accumulators The Galaxy GT-350 Transceiver, WIAEF. Wilf reviews a piece of equipment which is not yet

June 1940 A Two-Channel Convertor for Apollo Ecoty-tion, W6AJF Perhaps there are a number of VK Amateurs who wish this had appeared a month before Apollo 11. Come on fellows, don't despair, there is still time to build one for No. 12. The Fep Bettle Vertical, WASEMS. The Ameteur is noted for his skill in improvisation of WASEMS nakes a "Coca Cola" bottle into a WASENS makes pre-useful services and Receiver Opera-shouldeness Yeasamilier and Receiver Opera-dess, WZETY/I. A subject which should be dear to the hearts of all N.T.D. multiple dear to the hearts of all N.T.D. multiple

ties, WZEEY/I. A subject which should be dear to the hearts of all NJLD, "smittiple dear to the hearts of all NJLD, "smittiple dear to the hearts of all NJLD, "smittiple three bands simultaneously. A Current Sensitive Piles Lamp, WIURM. A Current Sensitive Piles Lamp, WIURM. The transmission of the control of the control of the An Improved Till Convertice for 14 and 15 of the VIZIN II meet two innovations in addition. VIZIN II meet two innovations in addition and "Q" multiplier. to the 'Interference of the American Comments and the American Comments Comme Inverted Vec Contest Antonna.

The layerted Yee Cestest Asianna, WEFGJ Describes there "droopy dipoles" using one pole, one feed line and co-axial feed for operation on bands from 6 be 50 meters. This is failed the golden of the communications systems used on trips such as that just completed by Apollo 11. It belied me answer questions from fellow workers and the kids

al home
"CQ" Review: The Heathkit SB-286 Linear
Amplifier, WIAEF Since these units are being
sold in Australia this will probably interest
outle a few.

"087"

Jame 1900

The QRF 88-88 C.W. Transmitter. WICER tearribes a small solid state rig for these two oppular bands. Uses only three transistors, a ener Clode and is crystal controlled. Anther interesting point is that all the inductor other interesting point is that all the anouvers are on forcide. Alzasinhum Tabing—What Siases are Avail-able. WiCP hats the sinse of round extreolar aluminium tubing available on the American market in grade 698-75 sids—78 which is considered to be the best all round grade for use by Radio Amateurs and others for building side for the considered to the considered to the considered to be the best all round grade for use by Radio Amateurs and others for building

antennas

Cathede Ray Tube Display Unit for Scieditic
Weather Pictures, WFUCV The picture repriducing system described here permits use of
the company control of the picture repriducing the company of the company

The Mainline TT/L-: F.S.K. Demodelater. "The Malaline TT/L-1 F.E.K. Demodelater. WESDZ continues the strike comisseed in May limit of the Market of the Ma apply in Australia.

standards, built at ours are, I suppose this well. Three Learnings are Field by N. KYYIM. There is no standard and the standa

which are really new are the ones which are solid state because the receiver a f. stages and the "pre-mixer" chains have sone solid Constructed Autennes for 1296 Mc.,

In this issue is an article 'Three Innovations for Field Day" and on page 53 a letter from W43RU on the use of motor car liternators for field day use. At the risk of buying an argument with some better technically quadred person, I am going to suggest a somewhat. different approach. The actual representation of the control of th different approach One of our Australian interpretent beam.

One of our Australian levelsion manufacturers builds his transformers of about 150 v.s.

rating at 80 c/s. onto bobbins which are very rating at 80 c/s. onto bobbins which are very of these, then I feel certain that the bobbins, core and cismp assemblies can be obtained from Anodeon Seles in your own State

Anodeon Sales in your own State transformers. The use of these three separate transformers that the sales is the sales of "RADIO COMMUNICATION" May 1980

A Simple Translator Periable D/F and General Purpose 169 Meire Bessiver, G3EDM. Direction finding has gained popularity in Essex through the regular D/F contests held in recent years by Chelmaford and Colchester Amsteur Radio groups

Redio groups Technical Vapies GSVA. regular fasture Technical Vapies GSVA. regular fasture Technical with PTF gist, adjustable vice stabilities, dual gate MOSFZT pre-amp; t.vi. requiper stabilities, recent equiperate of the property of th Atoda probe As Siendy as a Heck. GNGO continues his iscussion of crystal oscillators.

A Digital Cleek. G3PEG describes a digital -1---A Simule P.S.U. for the BC221, by GSMQT. Transistors for Amaieure, by GXXIW
A Roof Rack Fitting Top Band Mobile Whip,
GMBU Titles are self explanatory on the

latter "SHORTWAVE MAGAZINE"

May 1969 In this issue G2HCG, of J Beam Engineering Ltd., describes the development of a high gain system for 12, 15 and 20 metres, in an article titled "New Approach to Malthand Beam

titled 'Design' This is followed by Part 2, Circuit details, general layout and construction, alignment and testing of "Design for a C.W Transcoiver"

lesting of "Design for a C-W Transcatter".

The Edgistene 786 and 768 Executers, by G30GR follows. In this article the author gives helpful hints for those wishing to update these tube type receivers which are still cospable of giving quite good performence in the hands of someone with a reasonable amount experience and common sense.

of experience and common sense. The last article in the issue is Linear Amplifier for Two Metres, by GRDAH Part I of the description of a linear using a pair of GCX350s in p.p. This unit is designed to follow the authors' transverter described in the July and August 1988 Issues and to run the British legal lemit of 600 westep p.p. continued next page

May 1960

May 1000 "This time is sub-citied "Anissana Speciassiler." This time is sub-citied "Anissana Speciassiler. This time is considered to the control of the con

The Blant Ves Assesses, Mary O. 19. Stands of the Control of the C

one satest news on patching.

Direct Reading S.W.B. Indicator, K3WRW.

Tired of switching back and forth?

Asymmetrically Feeding Long Wirss, W2EEY.

Stronge things happen when you move the feed around. sed sround.
Compressed Vertical for 180, WSFPO. If you see room for a 120 ft tower, pass this by.
Class A Transister Amplifier Design, WASSWD.
leven steps to total and complete successives in the complete successives of the complete successives.

Probably Commission and complete uncease. Probably Complete uncease Probably Commission and Complete uncease and Commission an

Mini-Bomb, WCSYK. Another of his little b kw. amplifiers, almost. DX from DL Land, DLABR. What it is like ver on that end.

De Trem Die Land. Die Delle Whel is in its proposed to the pro

Lest month we had an Autenea Special and this month it is a "V.E.F Special". Bome readers may be wondering where all the cryp-ir comments to "73" articles come from I wouldn't know, but they are in the index. I

wouldn't anow, but they are in the index.

Jack Ways of Generality Micrower Power,

Jack Ways of Generality Micrower Power,

probably know about

The Committee of the Committee

Compleat A.V.C., WERHR. Showing how much can really be done to improve a.v.c. Leaky Lines, KZAGZ. Handom thoughts by random thinker a random thinker
Field Day Fever, VK4SS. Your field day
should only work out as well. A Field Bay to Remember, WEBVU. Field day can be loads of fun, give it a try this year. This must have been his first. Sanspet? Who Needs 'Em for Elx Mebre DXT KIALL Okky, 30 you can work 'em

NX XIALE Disty, so you can work 'em rithout summpon, too.
Whipping Two Mebüt, KEEFV. Make your way whip for two me'er mebüt. Some hamdy was wing for two me'er mebüt. Some hamdy sammen sammen

A.T.V. Video Modminion, WKORG One tran-nistor is all that it takes, V.E.F. FET. Mare Of, KSKTP Fre-amps. for 104, 422, etc. E.T.T.Y. Monitoring, WGJTT. Good news for all your ratts. Cartain Reds Cost-hazgers and Costep Lishts, KSKTH. V.H. and U.H. antennas from the

closet.

Facsimile and the Radio Amateur, Part 2, KSGKX Answers to questions about F.A.X. Selt Selder Construction of Carities and Lines, WASVFG, Makes those v.h.f. machining jobs 'ASVFG. Makes those v.h.f. machining jobs cinch, almost. Patter Converter, KSVQY. Enjoy the thrills I listening to police calls . . . If it isn't of particles and the like a season wells Small and it works like crary on 10, 15 and 20. You read it here. Tread it here.

Meditying a Tube Converier for FET, W60SA.

Makes a great improvement and doesn't cost

much.

A Variable Resistance V.F.O. for Six and
Twe. KGALD. Transistors. p.c. board, and
tuned from sirr Aliao very stable
tuned to the sirr Aliao very stable
v.h.f. bands with the ALA-10.
Sample Converter for Siew Suan T.V. and
Facatanile. WZLNP Ridsculously simple, if you
want to know. Let's get going. Confessions of an Appliance Operator, WEETQ

AMATEUR GETS JAIL SENTENCE

"QST" reports an event that should be warning to any ill-inclined Radio Amateur In November, in Bowling Green, Kentucky, KeKHE was convicted on seven separate count In November, in Bowling Green, Kentucky, KeKHE was convicted on seven separate counts of transmitting obscene, indecent and profase language on Amasteur frequencies. The case transmitting obscene, indecent and profase P.B.I. KEKHE was fined \$150 on each of the seven charges, totalling \$700. He was also sentenced to six months in jull on each count, each period to rum concurrently.

each period to run concurrently. Two other Kentucky Analeurs, WBHAOE and WEEBG, were convicted for similar reasons, each, and they are on probables for two years. Tay were slso fixed \$100 each. "GET" also reports that c.-WNEPNZ, or "GET" also reports that c.-WNEPNZ, or Anastrur licence due to consistent past viola-tions of F.C.C rules.

VICTORIAN DIVISION, W.I.A. V.H.F. CONVENTION

will be held on SATURDAY and SUNDAY. 11th and 12th OCTOBER, 1969

MOONDARRA RESERVOIR near MOE. Gloosland

Meals, Accommodation and Registration, approx. \$5 each.

Trade Displays, Fox Hunts, Scramles, Lectures, Bus Toursthe lot as usual.

Further Information Convention, P.O. Box 36, East Melbourne, Vic., 3002

VHF

Sch-Editor: CVRIL MALIDE, VK32CK 2 Clarendon St., Avondale Heights, Vic., 3034

Not much news at this time of the year. The most interesting to date is special prefix that has been allocated to us for next year, that has been allocated to us for next year, frequencies they can be used by Lindited incoses it they so destre As yet no form of award has been declied upon for v.hd. oppraticularly that has been declied upon for v.hd. opposition of the v.hd. opposition TOTO TOTAL

VICTOMIA
In a record too metre scramble on a cold
In a record too metre scramble on a cold
in a record too metre scramble on a cold
in a cold to the year of the year if is
ing numbers; for this time of the year if is
a large gathering Unfortunably on cold night
in the cold of the year if is
a waystion in accring to being made in the
form of a handlasp for these with have won a
hoped that this new system will give meet
incestive to those who have the attitude "I
hope". Full details will be ennounced on the
Sunney breadend on the Sunday of the scram-

Sunday broadcast on the Sunday of the scramble.

The VES Vh.f. Group holds its monthly meetings on the third Thursday of each month at 2000 hours E.A.S.T. and visitors are always welcome For Hunts are held on the Friday of the week following the Group meeting. Scrambles are on the second Sunday of each month.

During the summer months Field Days are beld at frequent intervals. The dates of the forthcoming Field Days are Sunday, Oct. 39. Sunday, Nev. 16. Sunday, Dat. 19. Thursday Jan. 1, Sunday, Jan. 29, Sunday, Feb. 16; and Monday, Mar. 30.

Jen. 1, Sunday, Jan. 25, Sunday, Feb. 16; and Monday, Mar 30. The Vh.f. Group will hold its 1969 Conven-tion over the week-end 11th and 12th October at the Moondara Reservoir, near More in Gippe-land. Further details appear elsewhere in this month's "A.R."

ABOUND AND ABOUT

ABOUND AND ABOUT
The VERT two metric beason VKTVF, which
the VERT two metric beason vKTVF, which
converting on 1413 Me. after having results
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or amplitude modulation Proposed ZL fm. net frequencies are 165.8, 166.8 and 165.3 Mc with a maximum deviation of plas or minus 8 kc., polarisation vertical. An interesting article in the W.A. V.h.f. Group Newaletter is about a system of cathods-less valves using Thorium 256 as the electron source.

The above information was gleaned from various magazines and newsletters.

W.I.A. 52 Mc. W.A.S. AWARD Cert. No. Cell Additional

			New Member:			Countrie			
85	Berry	*****	- 24	VK4VX	200	****	A010	-	
				menament	12				
26	400	2000	7861	VK4ZAZ	300		7979	8	
50	-	debte		VX2ASZ	1614	No.		3	

RE LOG BOOKS

A query raised at Canberra as to the length of time it is obligatory to keep a log book has been answered by the Department as paraphrased

The log book showing the record of transmissions should be available for inspection 12 months from the date of the last entry

NEW CALL SIGNS

MAY 1969 Radford, 50 Gouger St., Tor-DELAD. J. Barnes, 26 Dennis St., Garran, VKIZYT-D. S. Thomas, 5/17 Devenport St., Lyons, 2606. VK2AU-J. B. Thomas, 31 Hanbury St., Went-VK2CAW South, 1145. West Ryde, 2114. ØKet Ryde, 2114. VK2DG-A. J. Gillham, 34 Neerlin Rd., Castle Cove, 2655. VK2BGR-G J. G Smith, 18 Macasser St., Cowrs, 2784. VK2BU-J T Nance, 34 Spruce St., Blacktown, 2148.
VK2HI G.-I. Grimshaw, 28 Cliff Rd., Collarov. 2097 VK2BLM—I VKZBLM-L. Morrison, S Evans St., Peak-burst, 230. VKISBD-M. A. Du Feu, 34 Ivey St., Lind-Reld. 30. Vice, 38 Bulwarra Rd., Elean-VKZBL Los Heights, 130.1. VKZBP-P-P J Vernon, 10/7 Gilbert St., Dover Morrison, 3 Evans St., Peakors Heights, 2103.
VK2EFV.-P J Vernon, 10/7 Gilbert St., Dover Keights, 2003.
VK2EFW.-P, G. Wickender, 115 Victoris St., Lewisham, 5046.
VK2ES 273.
VK2ES170. A Riley, 35 Teviott St., Richmond, VK2ESN.-N. A Stratt, 1 Ventura Are., Mirsands, 2223. VK2BSN-R. 6. Spenson (Sqn. Ldr.), 53 Cox VK2CAS-A. G. Svenson (Sqn. Ldr.), 53 Cox St. Windsor, 2766 Ob., Windsor, 2700 VK2ZHG-M. J. Ferrall, 338 Moore Park Rd., Peddington, 2021 VK2ZKC--K. M. Cunningham, 55 Marshell St., New Lambton Heights, 2305.

New Lambion Neights, 2000.
VKZILU-L. M. DeKentis, 1000 Ashmont Ave., VKZZNN-R. N. Watson, 30 Rossford Ave., VKZZNN-R. N. Watson, 30 Rossford Ave., VKZZNN-R. N. Watson, 40 Rossford Rev., VKZZN-R. N. Watson, 40 Rossford Rev., R. Watson, 40 Rossford R

VK22FZ-W FIGH.

2800.
VK32KW-R R, Winston, St Cooper St., Cessnock, 2825,
VK22K-R, A We.ls, 11 Astlay Ave., Pad281 VK22FZ-VK12K-R, A We.ls, 12 Astlay Ave., Pad281 VK22FZ-VK12K-R, A We.ls, 12 Abardsen St.,
VK12K-R, A We.l Muswellbrook, 2335. VK22VO-R. P. Tester, 78 Lachlan St., Cowrs. VKEZZV-B E. Vicek, 100 Murray St., Tum-VKEZZV-B E. Vicek, 100 Murray m., zum-barumba 1853. VKNWJ-F. S. Kantor (Dr.), 22 Castella St., East Ivanhoe. 3078. VK3AFS-R G. Rowlands, 35 Crathoe Rd., Mt Waverlay, 3146. VK3BAB-S W Flatt, 2 Robinson St. Moc. VK39AK-3625 K—V, H Nisdeck, 18 Taiofa Ave., Ringwood East, 3125. Windowsod Mast, 1328.
WKENWY E. W. Perrier, 173 Alma Rd, Bala-VKEYE-E. B. Ball, 10 Kenilworth St., Sherwoot, 467 VKMY-E. B. Mall, 10 Kenilworth St., Soeth-Wood, 467 L. Cardell, 12 Neshit St., Soeth-Wood, 467 L. W. Kelly (Dr.), 285 Monaco St., VKMY-M. M. Kelly (Dr.), 285 Monaco St., VKMY-M. M. Kenilworth St., Soeth-WKMY-M. M. Kenilworth St., Sherwooth St., Sherwoot

VK40A-J P Baker, 18 Vanan, co., co., v. VK40A-J VK401-P R Tompton, 13 Comus St., Hamilton, Co., v. VK40A-R D. Roses, Station: 43 Wentworth Tee, Rockhampton, 400; Portal, C/a. Commonwealth Bank, Rockhampton,

Commonwealth Bank, Rockhamplen, K4VE. Commonwealth Bank, Rockhamplen, K4VE. Teachers College Radio Clab, Victoria Park, Rd., Kelvin Grove 4525. Cultiford St., Kelvin Grove, 4559. Cultiford St., Kelvin Grove, 4559. Cultiford St., Smithfield Plains, 5114. VK3SP. I. S. Hrown, 5 Indiarra St., Taperoo, VK3SB-1. S. Brown, 5 Indurra St., Taperco, 50.7 VK3XJ C. A. Pryzfbilla, 42 Burbridge Rd., Brooklyn Park, 5032.

VESTRALEN Derbinen, 3 Cerebine Ave.
VISSTRALEN DE Principen, 3 Bickford St.
VISSTRALEN, 1. Erspitzen, 3 Bickford, 1. Erspitzen, 1.

moni. 6010 VK8ZGF J A Hassell, Flat 18, 387 Stirling VK82-GF -J A Hassell, Flat 16, 367 Stirling H'way, Claremoni, 5010, 187 VKTKW-C. S. Perger, 37 Galvin St., Laun-ceston, 750 VK1RJ-R. H. Waldon, 11 Mayne St., Inver-may, 720 VKTRV-R. Chamberlain, 33 Lincoln St., Lind-VKTRV-R Chamberlain, 33 Lincoln St., Lindistarne, 7015.
VKTIT-T. W. Firth, 11 Resewood Rd., Risdon Vale, 7016.
VKTZNR-A. N. Richardson, 53 Camaron St., Launceston, 7256.

CANCELLATIONS

VICINI— B. W. Funch Decision of VICINI— C. Winds Decision of VICINI— C. Winds Set research of VICINI— C. W. Bork Not research of VICINI— C. W. Bork N CANCELLATIONS

Pensley. Not renewed Carter. Not renewed Volght. Now VK5GO. F. King (Cpl.). Transferred VK2ABC-P. D. to A.C.T Hambleton. Transferred to

VK22KZ-D. V Hambleton. Transferred to Western Aus VK2ZPL-S. W Platt. Now VK3BAB. VKZYZ-A. B. Hamfiton. Not renewed. VKZZX-N. J. Spaiding. Transferred to New Guines. VK4D—J. L. Thomason. Transferred to N.S. VKNNH—N S. Hill Now VK3DA. VKNNH—N S. Hill Now VK3DA. VK4PN—P. Lyons (Rev.). Ceased operation. VK4WA—W R. Attwood. Now VK5MC. VK4ZHH—E. B. Halt Now VK4Z. VK4ZLB—B. J. Byrne. Now VK1ZNR. VK4ZQ.—Toocher's College Radio Chub. N rred to N.S.W.

D. Ross. New VK4QU VK3HP—J. H. Lehmann. Transferred to Vic. VK3HP—J. M. Perriman. Not renewed. VKDPO-A. M. Perriman. Not renewed.
VKIDE-D. E. Burkhabaw Not renewed.
VKIKT-C. Lindsay Not renewed.
VKILL-K. M. Kelly (Dr.) Now VKMJ.
VKISS-P. R. Toospaon. Now VKGPI.
VKZCP-C. S. Perger. Now VKKWW.
VKZZHF. H. J. Ferrall. Now VKZZHG.
VKZZHF. H. Waldon Now VKZZHG.

ERRATA

In the July issue of "A.R." some drafting errors appeared in "300 W. P.E.P. 2 Metre Transmitter." The inductance in the cathode of V7a (overtone oscillator) should be 2.5 pH., not mH. The emitters in the two transistor stages are not marked They each have a 470 or resistor to earth, which will identify them. The second transistor stage is not an emitter follower as marked, but is an untuned amplifier,

Wagga District Radio Club

The Chab was insugurated at a general meting in June 1988 and it a member of the
cities activity in a provide the local Chub
activity is to provide the local Chub
Defence Organisation with a communication
Civil Defence Readquarters. Operations began
in the temporary premises of the Civil Defence
are the conducted in the perminent digatcan be considered in the perminent of the conducted of Chub members are also active members of
Civil Defence

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a T Mc. Dass station Base stations are operdevelopments are expected to include the provalues of a second 50-foot service lover and
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services are operational by December of this year.

Another important aspect of the Club activity
is fostering of V.R.S. activity by Brother
Jeffrey. VKZHI, at the Christian Brothers' College and progress has been such that other
V.R.S. stations will be in operation during
the coming year

the conting year more has been followed in An active programme has been followed in the programme has been added to so that five new licences have been gained by seembers Parther activities for members are supported by the programme has been added by VK contests. Jamboree-on-the-date, which indeed with the programme has been added to the programme has been added to programme has been added to jects, while continuing to offer AOCP, Tail-ning in theory. Moree code and regulations.

ing in theory, Morae code and regulations. Club members feel that the activity is furthering the interests of Amateur Radio in the Wagga Wagga area and providing a valuable with Civil Defence Organisations. The links with Civil Defence Organisation and the time of the Civil Book of

OBITUARY

JOSEPH GRIFFITHS REED VKtJR It is with deep regret that we record the sudden passing of one of the resi "Old Timers," Joe Reed, VK2JR. Joe died suddenly on 29th July

the had a long career in the world of radio, in fact dating back to at least 1810 when he was just a schoolboy. Space does not permit a full listing of all Jos's contributions to radio whilst employed by the Navy, P.Af.G's Department, A.W.A.

elc. He was a regular contributor to "Anna-feur Radio" and was responsible for many tapes in the VKZ Division library. He was never too busy to halp anybody resulted in several type-written pages and diagrams in the next day's mall. To his family, we convey our condoi-checks and assure them we feel their loss as much as they themselves.

VICTORIAN DIVISION, W.I.A. WESTERN ZONE CONVENTION

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Sub-Editor DON GRANTLEY P.O. Box 222 Penrith, N.S.W., 2750 (All times in GMT)

This worth has preduced some reliability good or raise her in each or the format of the following th

At the time of writing, Gus W4BPD had cut short bis jount in the VQ8 area due to trans-port difficulties and last heard, he was heading for Kenya

YB12Z has been logged here in Australia, and has a very fast QSL return if sent to M R T Patsh, Let Kol. Police Force, Box 3. Bandung, Indonesia.

The many pattern and the patte

repaired after that day.

On the afternoon of 25th, diamantling commenced, with the last QSO being sent at 1860s after 71 hours operation. Due to the allower boat, they had to leave Navasas 12 hours earlier, nevertheless 11.62 QSOs were made with good coverage to all continents.

You will note in the QTR section of July "AR" I listed Jack Cally as Ca Jack has to QRT at about 1160 day, but as he will be on Nauru for three years there will be plenty of time

ZKIKR has been heard in the mornings work-ing Europe on 20 metre c.w., giving his QTH as Niue and QSL manager W3CTY Aland is operation recently reports on 7 and 14 c.w. and s.k. says QSL to home address Box 40015, Helsinki, Finland The station has been reported at good strength from VK3. The prefixes PQ, PR, PS, PT and PU, which were active during the W.P.K. Contest back in April, were all Brazilian and 100 stations from that country were lasued with them from that country were issued with them.

Currently active from Jan Mayen Is. JX10M, JX3BH, and JX5CL. Average time of setivity as lated in a report seems to be from 1400x to 2000x.

JX3DH is the only one shown as active on 7 Me, actually 7000 s.e.

The special cell sign PEREVO, setive on least, at around 1500x, is situated in the Phillips Co., Netherlands I didn't note just who said it, but I gleaned from the Pacific net on 4th July that a weather station is being built on Bouvet is, and will have Amsteur activity

KF7BSA, who was in great demand during the Pacific Net on 18th July, was operating from a Scout Jamboree in Idaho.

from a Scout Jemberce In Idaho
The operation of LLES on the Ill-laied emp
The operation of LLES on the Ill-laied emp
has hed sufficient coverage in the dally press.
heavey many Annaless contacts were made
end of A-gast, and should go via LASIC. Box
18. Separation Norway with five IRCs for
RAMEDY, still working from Kure R., is
always a placeare to heer. The way Dist gov
LASIC property of the Company of the State of the State
RAMEDY, still working from Kure R., is
always a placeare to heer. The way Dist gov
thing Frequency is 1402 and gGL to Box R.
FPO, San Francisco, SSIGL, USA

Sad to report the deaths of two well known DXers. Charles HBBADO passed away on 11th April and Arme SMSPW on 29th March. Arme was well known for his /MM operation and his YUILAE jounts, whilst Charles was better known for his activity as 4WIADO.

Martin GIVOF, together with other Amsteurs, GIVGY, WAB and XQC, are active most days from Billericay in Essex on 18 a.s.b., and are anxious to know how their signals are setting out. They will appreciate GSOs from this part of the world, also will answer any reports. QSLs can go via LS WL Bureau.

The station signing HU1P was quite in order This prefix is used in El Salvador for special activities such as contests.

Regular operation from Taiwan can be found in 14027 c.w., where BV2A is crystal con-rolled His operating time is 1130r to 1430r, and QSLs via WESKUP for American stations and QSLs via

and gene only in the official magazine of the IS.W.L., reports that a station signing 2BSDC claiming to be in Biafra has been worked, however at their stage it will not count due to the political situation, and lack of licensing authority and the stage it will not cause the political situation, and lack of licensing authority and the stage when the stage of the stage

situation, and lack of licensing authority Operation from West Pskitsten by Ahmed APIAD continues. He is operating transceive on 14208 a.a.b and handling the dog piles really well. He has been worked in VK at about 2100z, whilst other reports show him setive at many other times. QTH: Box \$4, Lyallpur, West Pakitstan.

An unexpected operation occurred on 1433 recently when OREBH/OHO/SR come on from Starp Reef in the Bellie from 115ts to 640ts in the one day. It is not a new country at his stage, but in keeping with the common trend, it could well be Says QSL to OMIABI/Starp Reef

If you have been waiting for a card from EARAA, don't despair, he has had new cards printed and they are in the process of being issued, to try and offset the backlog. From LATRF comes the news that JWICI to follow the following the following the following followi

Recent activity from GDSLNS and GDIKDB went off very well, with good contacts of TMC. QSL ps to GZLNS and GSKDB, or to QSL manager WBNYQH, Robt. Nadolny, 72 S. Pierre St. Buffalo, N. 14276

The proposed trip by WB#KBK and HK op-erators to Serrans Bank and Romoador Cay has been cancelled as permission was not forth-

TFIRA is the DX-pedition by Haddi and Berger working transceive on 14188. Not an easy country to find, but they have been active at around 650tz, with QSLs to Box 1658, Reykjavik, Iceland Operation from Kuwaii is plentiful at pre-sant with SKIBF operating franceive on 1252 180x 1803. Kuwait: SKIAA. on 14001, and SKIBF littening on 14775 transmitting 14185 at 0220c. QSL to 80x 8418, Kuwait.

FOUS-FC will be WIPRI and XYL, tagether with HB9TL. Bob planned to operate /AM on the way over, and their operating frequencies were listed as 1640 and 31310. Other Coralean operation by F3FD/FC on 16677, QSL to home

were listed as 1930 me control by 1930/16 to home control by 1930/16 to home control by 1930/16 to home considered and the operator. Measurementally completed and the operator. Measurementally completed and the operator. Measuremental to the operator of the operator operator of the operator op

The following is a summary of recent VP2 scivily VP1AZ top KSAADI QSL to WA-SLES VP2X KK LZ and VI to WZIVW whitely VP2VT goes to the operator's home QTH VZ-2AFC, and VP2VK is at Box 1737, St. Thomas, Virgin is, 00001 KC6AT is active from the East Carolines. He has been active on 14230 from 1000-1200r and QGLs go to Box 94, Ponape, East Caroline 1r, 56901

Further operation reported from Allend 1s. this time by DLINS/OHO, who expects to be active during August and September on 3516. 7010 14050, 21050 and 28050 c.w., Sundays from 120ct for one hour on each band. GSIM 10

120ct for one hour on the DLTMQ
Gilbert TLSGL is now QRT and will not be
returning. Logs of the operation are available and QSLs should go to VEEDCY. Bernard
Leblanc. 2009 Lacordaire. Montreat. 458. P.Q. Operation from Tristan Do Cunha by Roy GMEDY continues, he is listed to stay there for 2½ years. He is listed on all bands, but a challenge would be his operation from 778 s.s.b., where he is every Saturday and Monda from 2100. Little hope from here at that time QSL to GRESM

QSL MANAGERS SASEE-DLIFT SVAAD-DLIFA SAITY HERADP SAITR-DISOH SASTX-WASHUP SH3LV VESODX SLIBJ WASHUP. SLID-WSEJ ST PUAT-EIPE SRSAN-K4IE. SGICG-WAZHUP 8RIS-VEXDLC 8RIX. U. Z-VEXDLC

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SOME OTH SAFTE-Bex 3184, Tripoli, Lybia 5LZBA-Box 987, Monrovia, Liberia. SWSBJ B.P 62, Thies, Senegal Republic 7PSAR-Ulli Dehning, Box 194, Maseru, LesothosRIJ-P Taylor, Box 557, Georgetown, Guyana-

SRIT Sonia Blue, Box 25, Georgetown, Guyana 9G1DY Norman Price, Box 44, Tarkwa, Ghana sM6HM-C/o. Police Hdgrs., Kota Kinabalu, SASSP—Deutsche Welle, B.P. 410, Kigali, RYSSP—Deutsche Welle, B.P. 410, Kigali, RYSTAE—Box 107, Natitingou, Dahomey Rep., Africa

WNIJKQ—Les Bowman, 1850 Hawthorns St., Forest Gve., Ors., 97118. YEBAR—J. Hertsdi Kertayasa, Gunung Sahari SI. Djakarta. YKIAA—Rasheed Jalal, Box 38, Damascus, AWARDS

The Lincoln Century Award is issued by the Lincoln Short Wave Club to Amateurs and SwiTs alike, with no date limit for contacts; endorsements for band and mode, cost is 7/8 or one dollar U.S. or 10 IRCs. Issued in five classes, class E with 109 points through to class A with 500 points. Points are issued thus: Stations in the Lincoln Postal District,

Stations in the county of Lincolnshire, England Stations in the Lincoln Country of

oln Short Wave Club Station Stations in any other world town of

Contacts on w.h.f. and with C.H.C. or FH C members are double. Send certified lists of QSLs with sent QTHs of all Lincoln stations to Stew Poster, SH Goldsmith Walk, Lincoln, England. Three are no Lincolns in VK however we might get away with VKFs Lincoln with Row about 18 Sews.

With that lot, I shall climb back up the ladder and prepars some sort of an antenna for the forthcoming VK/ZL Contest.

My thanks to Eric Treblicock, Maurie Batt, Benrard Rughes, Geoff Watts DX News-sheet, LS WL "Monitor," Sleve Ruediger, VKI Brosdcast, Long is, DX Asm, and Mac Hil-lland, for information supplied, See you next Stard, for information supplied month, 73 de Don WIA-L3022

CONTEST CALENDAR 4th/5th October: VK/ZL/Oceania DX Contest

(Phone). 11th/12th October. VK/ZL/Ocesnia DK Contest 11th/12th October R.S.G.B 36 Mr. Telephony Contest 18th/19th October W.A.D.M DX Contest (CW only October: "CQ" W.W. DX Contest 25th/26th October: "CQ" W.W. DX Contest 1Phone! 25th/26th October: R.S.G.B. 7 Mc. Contest 9th November International OK DX Contest Sth/Sth November R.S.G.B. T Mr. Contest (Phone)
18th/Sth November R.S.G.B. 1.8 Mc Contest 28th 36th November "CQ" W W DK Contest (CW.

60s Dec. 1698 to 11th Jan. 1970—Ross A. Hull

V h.f. Memorial Contest.

6th/7th December. C.H.C. International DX

Contest (CW)

130h/14th December C.H.C. International DX

Contest (SSSH)

1st/2nd February John M. Moyle National

Field Day.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

PARTICIPATION BY LIMITED LICENSEES Editor "A R.," Dear Sir,

I was very pleased to read in the August edition of "A R." the plans for Amateurs to celebrate the Cook Bi-Centenary/W.LA. Dismond Jubilee and especially the Bi-Centenary

mond Jubilies are several mond Jubilies are several My only disappointment is the exclusion of My only disappoint this award. I don't need to point out that the rules would exclude us but they state, "Available free to any licensed Amsteur throughout the world" of our band allocations we licensed Annaeur throughout the world".

Although, due to our boand allocations we are unable to convey our feeling of pride to more look basis in the country whose. Bi-Centenary we are celebrating. Granted it Centenary we are celebrating. Granted it Centenary we are celebrating of the control of complete cellulary in an confident something could be exclusion?

arranged.

How about an Amateur with less than 25
ACTIVE Hams in a radius of 100 miles contact
20 of them to qualify for this award? And
those in mors densely populated steas a proportionly greater number _Feter Collins, VK3ZYO

COPIED C.W. VISUALLY Editor "A.R.," Dear Sir.

The resourcefulness by which a person who has no hearing has let himself into the field of Ham Radio prompts me to write to this column.

Some time ago I had a card from Jan Verstelle, a Dutch S.w.I. reporting on my centact
with: a D. Jan pointed out that he could not
with: a D. Jan pointed out that he could not
fig had no means of copying speech, but displayed cw. on a caittode ray tube and copiad
it visually Presumebly he wrote as well as
he could without taking his eyes of the tube. I sent Jan a QSL and told him that I had put his card among the few I pinned up in the shack for affectionate or honourable reasons and today I had a letter from him, and I give

here verbatim. here veroatim. Beg your pardon that I ... The Total To

It down:

"I hope you demonstrated my card to deal people in your surroundings because roany dear people in Molkade think that reasons that people in Molkade and on not dare to take hold of it think your ball on not dare to take hold of the world and tendoy my shack very mechate world and tendoy my shack very mechate your shade of the world and tendoy my shack very mechate to the world and tendoy my shack very mechate to the world and tendoy my shack very mechate to the tendon to the tendor to the ten

Not only did Jan's effort impress me very motion, at its own right, it brought home to me abbe to reach where nothing else can. Though I have top class modern s.b. geer, I can rarely be lared into using phone and am particularly glad that I was working c.w when Jan was "having a look round the bend". Tony Brinkley, VK18G.

NOVICE LICENCE

Editor "A.R " Dear Sir.

Editor "A.R." Deer Sir.

Prempted by two letters in August "Ama-teur Radio" I would alse to register my sup-teur Radio" I would alse to register my sup-teur parties of the superior of such a licence as there has been sufficient said on the natter by others. I show believe that a or the matter by others a loss believe that a velopment of Amateur Radio in this country I feel that many of the objections raised by the oppounts of a Movier Licence scheme set This fact that I are suvene rise found? The fact that I or anyone else found it easy to obtain an A O C P is no argument against having a Novice Licence. Also I cannot under-stand the Victorian Division in having the set limit owered to IS for a full licence as an

alternative to a Novice Licence. The lower Morse speed limit also has doubtful advantages Surely a lower class licence would be a better apprenticeship for a young licensee

expectations for a young increase and along with this planny and their restrictive view of the same properties of the properties of a modern tree properties of the properties of a modern tree properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties of a modern tree modern properties of the properties o

of the privileges of a modern free acciety. To remove Annateur Radio would be a threat to all misority groups who onlys special privi-ing the property of the state of the property of the pro-tincetty, either in business or pleasure. Con-tinually saking the Rodio Awasteur to justife to the desired result. The authorities may be come convinced that we ourselves do not think we are yearstified in keeping our hobby, with dispaterous results.

outhierated February 2, explain amount of un-clearable operating recepting into activity on the bonds. Conversations and operating which are not qualte in accordance with regulations for our image. This is apparently becoming a problem overseas, Judging from articles in problem overseas, Judging from articles for the problem overseas and the problem overseas and the problem overseas and the problem overseas articles are the problem overseas and the proble -J. A. Adrock, VKSACA

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number to the mint intricate uses. Beginning where the scope manual along, the sather covers best waveforms (d.e., gian, and the sather covers best waveforms (d.e., gian, and the sather covers best waveforms (d.e., gian, and the sather covers and the sather covers

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Chapter 5 shows how valuable the scope is in radio and t.v. alignment, as the author extended and t.v. alignment, as the author extended and t.v. alignment, as the author extended and sevel as unique situations. Further tests and measurements are divulged in later chapters—audio measurements, power output calculations, video, hum, current-plus special oscilloscope techniques, probes, etc. Of special value are the numerous experistep-by-step procedures specifically planned for familiarisation with the methods for performing tests and measurements with an oscilloscope. Here the reader will find the information need-ed to make comparisons of direct and amplified signals, defect audio signal distortion, observe signals, detect audio signal distortion, observe transmitter modulation pricentage, employ square-wave response tests, perform capacitor leakage measurements, set up dual-trace dis-plays, analyse and interpret various waveforms, understand and use various probes, and many other important aspects of practical oscille scope application An extremely valuable reference and guide or those now using scopes and those who would

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AUDIO SYSTEMS HANDBOOK By Norman H. Crowberst

This brand new authoritative handbook is just what the itils suggests—a reference and guide to audio system design, as useful for engineers and technicians as well as for audiophiles. It encompasses home entertainment, commercial sound and studio installations. audiophiles It encompenses nome entertain-sient, commercial sound and studio installa-tions. Eased on his extensive experience in the field, the author approaches each subject in a practical way. Where theory is essential to an adequate presentation of the facts, it is holled down to its simplest terms

Chapter L. covering amplifiers and ampli-cation, explains db. and impedances, level limitations, insertion gain, plus a host of other basics necessary for practical system design. limitations, insertion; garn, pitte a nors or unable in example of the basic necessary for practical pysion design, basic necessary for practical pysion design, and the property of the prope

systems. "Audio Systems Handbook" imparts a firm knowledge of microphone sharacteristics loud-seases utilisation, and other scrows required southern statement of the statement of the numbers and the statement of the statement on understanding of such terms at loudness compensation, constant-voltage lines, low-level distribution, sectronically sensested satio, fre-versible statement of the statement of the severible statement of the statement of the severible statement of the statement of the severible statement of the severible statement of the severible statement of mach more Toler reader will learn how to put mach more Toler reader will learn how to put the severible statement of the severible statement of severible sta everybration, pre-emblasis, power margin, electrical and electronic croscovers and much electronic recovers and much electronic recovers and much electronic recovers and much electronic recovers and electronic recovers a system together, the requirements of commercial sound installations the standards of commercial sound installations the standards stilled, and the rudments of fluidapseker systems—both much and sterets, witcher systems and components, how to install them of fluidapseker systems and components, how to install them of fluidapseker systems and components, how to install them of fluidapseker systems and components, how to install them of fluidapseker systems and components, how to install them of fluidapseker systems and components and the systems and components and the systems and the systems and the systems are systems and the systems are systems and the systems are systems. The systems are systems and the systems are systems.

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SILENT KEYS

It is with deep regret that we record the passing of the following

VK2JR-J. G. Reed VK4CK-Len Schnitzerling. VK4CL-Joe Waterworth. VK4DK-John Kelly.

FEDERAL CONSTITUTION CHANGE OF WIA

Notice of Motion following has been given to Federal Executive by the Victorian Division of the W.I.A.

"That Clause 62 of the Federal Constitution be amended by deleting the word 'March' and insecting in less these constitution that there of the red 'Annancy'.

of the Federal Constitution the definition of the term 'Fiscal Year' be deleted and in lieu thereof be inserted 'Fiscal year means the year commercing the first day of January's in each year The effect of this is to change the financial year's commencing and finishing dates to allow more time for the preparation of sudied statements to be submitted to the Federal Convented

Article 70 of the Federal Constitution requires the publishing of this notice in two consecutive issues of the Institute's official journal.

-Peter D. Williams, VK3IZ. Federal Secretary, W.L.A.

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RESEARCH LABORATORIES' "OPEN DAY"

The Post Office Research Laboratories in Melbourne plans to hold an "Open Day" programme over a few days in September and it is thought it may interest readers of "A.R."

The Research Laboratories are at present carrying out more than 200 projects of varying magnitudes and a comprehensive exhibition of the work being done is planned for visitors.

The main concern of the Laboratories is to solve technical and research problems facing the Post Office.

Its work includes basic research and development in telecommunications theory and practice under Australian conditions, the design and development of telecommunications or mail-handling plant most suitable for Australia and an appraisal of world developments in telecommunications.

The Research Laboratories are housed in several buildings at the eastern end of the city and transport between buildings will be arranged by the Post Office. Inspection tours for visitors will begin at 59 Little Collins Street. Melbourne

The timetable for the "Open Day" is: Monday, September 15-2 p.m. - 4.30 p.m.

Tuesday, September 16-10 a.m. — 4.30 p.m. 7 p.m. — 9.30 p.m.

Wednesday, September 17— 10 a.m. — 4.30 p.m. Thursday, September 18-10 a.m. - 4.30 p.m.

(reserved for students) For further information contact the Information Officer at the Research Laboratories—Melbourne 630-7932,

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